



# Sequence Listing

> SMITH, VICTORIA

<120> METHODS AND COMPOSITIONS FOR DETECTING DYSPLASIA

<130> P2000R1

<140> US 10/712,124

<141> 2003-11-13

<150> US 60/425,813

<151> 2002-11-13

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| Met | Asp | Tyr | Leu | Leu | Met | Ile | Phe | Ser | Leu | Leu | Phe | Val | Ala | Cys |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |  |
| Gln | Gly | Ala | Pro | Glu | Thr | Ala | Val | Leu | Gly | Ala | Glu | Leu | Ser | Ala |  |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |  |
| Val | Gly | Glu | Asn | Gly | Gly | Glu | Lys | Pro | Thr | Pro | Ser | Pro | Pro | Trp |  |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |  |
| Arg | Leu | Arg | Arg | Ser | Lys | Arg | Cys | Ser | Cys | Ser | Ser | Leu | Met | Asp |  |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| Lys | Glu | Cys | Val | Tyr | Phe | Cys | His | Leu | Asp | Ile | Ile | Trp | Val | Asn |  |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
| Thr | Pro | Glu | His | Val | Val | Pro | Tyr | Gly | Leu | Gly | Ser | Pro | Arg | Ser |  |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| Lys | Arg | Ala | Leu | Glu | Asn | Leu | Leu | Pro | Thr | Lys | Ala | Thr | Asp | Arg |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Glu | Asn | Arg | Cys | Gln | Cys | Ala | Ser | Gln | Lys | Asp | Lys | Lys | Cys | Trp |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Asn | Phe | Cys | Gln | Ala | Gly | Lys | Glu | Leu | Arg | Ala | Glu | Asp | Ile | Met |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Glu | Lys | Asp | Trp | Asn | Asn | His | Lys | Lys | Gly | Lys | Asp | Cys | Ser | Lys |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Leu | Gly | Lys | Lys | Cys | Ile | Tyr | Gln | Gln | Leu | Val | Arg | Gly | Arg | Lys |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Ile | Arg | Arg | Ser | Ser | Glu | Glu | His | Leu | Arg | Gln | Thr | Arg | Ser | Glu |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Thr | Met | Arg | Asn | Ser | Val | Lys | Ser | Ser | Phe | His | Asp | Pro | Lys | Leu |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
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&lt;212&gt; DNA

&lt;213&gt; Homo sapien

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<212> PRT

<213> Homo sapien

<400> 4

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| Met | Glu | Lys | Ile | Pro | Val | Ser | Ala | Phe | Leu | Leu | Leu | Val | Ala | Leu | 1   | 5   | 10  | 15 |
| Ser | Tyr | Thr | Leu | Ala | Arg | Asp | Thr | Thr | Val | Lys | Pro | Gly | Ala | Lys | 20  | 25  | 30  |    |
| Lys | Asp | Thr | Lys | Asp | Ser | Arg | Pro | Lys | Leu | Pro | Gln | Thr | Leu | Ser | 35  | 40  | 45  |    |
| Arg | Gly | Trp | Gly | Asp | Gln | Leu | Ile | Trp | Thr | Gln | Thr | Tyr | Glu | Glu | 50  | 55  | 60  |    |
| Ala | Leu | Tyr | Lys | Ser | Lys | Thr | Ser | Asn | Lys | Pro | Leu | Met | Ile | Ile | 65  | 70  | 75  |    |
| His | His | Leu | Asp | Glu | Cys | Pro | His | Ser | Gln | Ala | Leu | Lys | Lys | Val | 80  | 85  | 90  |    |
| Phe | Ala | Glu | Asn | Lys | Glu | Ile | Gln | Lys | Leu | Ala | Glu | Gln | Phe | Val | 95  | 100 | 105 |    |
| Leu | Leu | Asn | Leu | Val | Tyr | Glu | Thr | Thr | Asp | Lys | His | Leu | Ser | Pro | 110 | 115 | 120 |    |
| Asp | Gly | Gln | Tyr | Val | Pro | Arg | Ile | Met | Phe | Val | Asp | Pro | Ser | Leu | 125 | 130 | 135 |    |
| Thr | Val | Arg | Ala | Asp | Ile | Thr | Gly | Arg | Tyr | Ser | Asn | Arg | Leu | Tyr | 140 | 145 | 150 |    |
| Ala | Tyr | Glu | Pro | Ala | Asp | Thr | Ala | Leu | Leu | Leu | Asp | Asn | Met | Lys | 155 | 160 | 165 |    |
| Lys | Ala | Leu | Lys | Leu | Leu | Lys | Thr | Glu | Leu | 170 | 175 |     |     |     |     |     |     |    |



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<213> Homo sapien

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| Met | Arg | Gly | Leu | Gly | Leu | Trp | Leu | Leu | Gly | Ala | Met | Met | Leu | Pro | 1   | 5   | 10  | 15 |
| Ala | Ile | Ala | Pro | Ser | Arg | Pro | Trp | Ala | Leu | Met | Glu | Gln | Tyr | Glu | 20  | 25  | 30  |    |
| Val | Val | Leu | Pro | Arg | Arg | Leu | Pro | Gly | Pro | Arg | Val | Arg | Arg | Ala | 35  | 40  | 45  |    |
| Leu | Pro | Ser | His | Leu | Gly | Leu | His | Pro | Glu | Arg | Val | Ser | Tyr | Val | 50  | 55  | 60  |    |
| Leu | Gly | Ala | Thr | Gly | His | Asn | Phe | Thr | Leu | His | Leu | Arg | Lys | Asn | 65  | 70  | 75  |    |
| Arg | Asp | Leu | Leu | Gly | Ser | Gly | Tyr | Thr | Glu | Thr | Tyr | Thr | Ala | Ala | 80  | 85  | 90  |    |
| Asn | Gly | Ser | Glu | Val | Thr | Glu | Gln | Pro | Arg | Gly | Gln | Asp | His | Cys | 95  | 100 | 105 |    |
| Leu | Tyr | Gln | Gly | His | Val | Glu | Gly | Tyr | Pro | Asp | Ser | Ala | Ala | Ser | 110 | 115 | 120 |    |
| Leu | Ser | Thr | Cys | Ala | Gly | Leu | Arg | Gly | Phe | Phe | Gln | Val | Gly | Ser | 125 | 130 | 135 |    |
| Asp | Leu | His | Leu | Ile | Glu | Pro | Leu | Asp | Glu | Gly | Gly | Glu | Gly | Gly | 140 | 145 | 150 |    |
| Arg | His | Ala | Val | Tyr | Gln | Ala | Glu | His | Leu | Leu | Gln | Thr | Ala | Gly | 155 | 160 | 165 |    |
| Thr | Cys | Gly | Val | Ser | Asp | Asp | Ser | Leu | Gly | Ser | Leu | Leu | Gly | Pro | 170 | 175 | 180 |    |
| Arg | Thr | Ala | Ala | Val | Phe | Arg | Pro | Arg | Pro | Gly | Asp | Ser | Leu | Pro | 185 | 190 | 195 |    |
| Ser | Arg | Glu | Thr | Arg | Tyr | Val | Glu | Leu | Tyr | Val | Val | Val | Asp | Asn |     |     |     |    |

|     |     |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |  |  | 210 |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|-----|
| Ala | Glu | Phe | Gln | Met | Leu | Gly | Ser | Glu | Ala | Ala | Val | Arg | His | Arg |  |  |     |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |  |     |
| Val | Leu | Glu | Val | Val | Asn | His | Val | Asp | Lys | Leu | Tyr | Gln | Lys | Leu |  |  |     |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |  |     |
| Asn | Phe | Arg | Val | Val | Leu | Val | Gly | Leu | Glu | Ile | Trp | Asn | Ser | Gln |  |  |     |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |  |     |
| Asp | Arg | Phe | His | Val | Ser | Pro | Asp | Pro | Ser | Val | Thr | Leu | Glu | Asn |  |  |     |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |  |     |
| Leu | Leu | Thr | Trp | Gln | Ala | Arg | Gln | Arg | Thr | Arg | Arg | His | Leu | His |  |  |     |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |  |     |
| Asp | Asn | Val | Gln | Leu | Ile | Thr | Gly | Val | Asp | Phe | Thr | Gly | Thr | Thr |  |  |     |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |  |     |
| Val | Gly | Phe | Ala | Arg | Val | Ser | Ala | Met | Cys | Ser | His | Ser | Ser | Gly |  |  |     |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |  |     |
| Ala | Val | Asn | Gln | Asp | His | Ser | Lys | Asn | Pro | Val | Gly | Val | Ala | Cys |  |  |     |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |  |     |
| Thr | Met | Ala | His | Glu | Met | Gly | His | Asn | Leu | Gly | Met | Asp | His | Asp |  |  |     |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |  |     |
| Glu | Asn | Val | Gln | Gly | Cys | Arg | Cys | Gln | Glu | Arg | Phe | Glu | Ala | Gly |  |  |     |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |  |     |
| Arg | Cys | Ile | Met | Ala | Gly | Ser | Ile | Gly | Ser | Ser | Phe | Pro | Arg | Met |  |  |     |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |  |     |
| Phe | Ser | Asp | Cys | Ser | Gln | Ala | Tyr | Leu | Glu | Ser | Phe | Leu | Glu | Arg |  |  |     |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |  |     |
| Pro | Gln | Ser | Val | Cys | Leu | Ala | Asn | Ala | Pro | Asp | Leu | Ser | His | Leu |  |  |     |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |  |     |
| Val | Gly | Gly | Pro | Val | Cys | Gly | Asn | Leu | Phe | Val | Glu | Arg | Gly | Glu |  |  |     |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |  |     |
| Gln | Cys | Asp | Cys | Gly | Pro | Pro | Glu | Asp | Cys | Arg | Asn | Arg | Cys | Cys |  |  |     |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |  |     |
| Asn | Ser | Thr | Thr | Cys | Gln | Leu | Ala | Glu | Gly | Ala | Gln | Cys | Ala | His |  |  |     |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |  |     |
| Gly | Thr | Cys | Cys | Gln | Glu | Cys | Lys | Val | Lys | Pro | Ala | Gly | Glu | Leu |  |  |     |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |  |  |     |
| Cys | Arg | Pro | Lys | Lys | Asp | Met | Cys | Asp | Leu | Glu | Glu | Phe | Cys | Asp |  |  |     |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |  |     |
| Gly | Arg | His | Pro | Glu | Cys | Pro | Glu | Asp | Ala | Phe | Gln | Glu | Asn | Gly |  |  |     |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |  |  |     |
| Thr | Pro | Cys | Ser | Gly | Gly | Tyr | Cys | Tyr | Asn | Gly | Ala | Cys | Pro | Thr |  |  |     |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |  |  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ala | Gln | Gln | Cys | Gln | Ala | Phe | Trp | Gly | Pro | Gly | Gly | Gln | Ala | 515 | 520 | 525 |
| Ala | Glu | Glu | Ser | Cys | Phe | Ser | Tyr | Asp | Ile | Leu | Pro | Gly | Cys | Lys | 530 | 535 | 540 |
| Ala | Ser | Arg | Tyr | Arg | Ala | Asp | Met | Cys | Gly | Val | Leu | Gln | Cys | Lys | 545 | 550 | 555 |
| Gly | Gly | Gln | Gln | Pro | Leu | Gly | Arg | Ala | Ile | Cys | Ile | Val | Asp | Val | 560 | 565 | 570 |
| Cys | His | Ala | Leu | Thr | Thr | Glu | Asp | Gly | Thr | Ala | Tyr | Glu | Pro | Val | 575 | 580 | 585 |
| Pro | Glu | Gly | Thr | Arg | Cys | Gly | Pro | Glu | Lys | Val | Cys | Trp | Lys | Gly | 590 | 595 | 600 |
| Arg | Cys | Gln | Asp | Leu | His | Val | Tyr | Arg | Ser | Ser | Asn | Cys | Ser | Ala | 605 | 610 | 615 |
| Gln | Cys | His | Asn | His | Gly | Val | Cys | Asn | His | Lys | Gln | Glu | Cys | His | 620 | 625 | 630 |
| Cys | His | Ala | Gly | Trp | Ala | Pro | Pro | His | Cys | Ala | Lys | Leu | Leu | Thr | 635 | 640 | 645 |
| Glu | Val | His | Ala | Ala | Ser | Gly | Ser | Leu | Pro | Val | Leu | Val | Val | Val | 650 | 655 | 660 |
| Val | Leu | Val | Leu | Leu | Ala | Val | Val | Leu | Val | Thr | Leu | Ala | Gly | Ile | 665 | 670 | 675 |
| Ile | Val | Tyr | Arg | Lys | Ala | Arg | Ser | Arg | Ile | Leu | Ser | Arg | Asn | Val | 680 | 685 | 690 |
| Ala | Pro | Lys | Thr | Thr | Met | Gly | Arg | Ser | Asn | Pro | Leu | Phe | His | Gln | 695 | 700 | 705 |
| Ala | Ala | Ser | Arg | Val | Pro | Ala | Lys | Gly | Gly | Ala | Pro | Ala | Pro | Ser | 710 | 715 | 720 |
| Arg | Gly | Pro | Gln | Glu | Leu | Val | Pro | Thr | Thr | His | Pro | Gly | Gln | Pro | 725 | 730 | 735 |
| Ala | Arg | His | Pro | Ala | Ser | Ser | Val | Ala | Leu | Lys | Arg | Pro | Pro | Pro | 740 | 745 | 750 |
| Ala | Pro | Pro | Val | Thr | Val | Ser | Ser | Pro | Pro | Phe | Pro | Val | Pro | Val | 755 | 760 | 765 |
| Tyr | Thr | Arg | Gln | Ala | Pro | Lys | Gln | Val | Ile | Lys | Pro | Thr | Phe | Ala | 770 | 775 | 780 |
| Pro | Pro | Val | Pro | Pro | Val | Lys | Pro | Gly | Ala | Gly | Ala | Ala | Asn | Pro | 785 | 790 | 795 |
| Gly | Pro | Ala | Glu | Gly | Ala | Val | Gly | Pro | Lys | Val | Ala | Leu | Lys | Pro | 800 | 805 | 810 |

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Thr Gly Gly Ser Ser Ala Val Ala Gly Gln Trp Pro Trp Gln Val
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Ser Ile Thr Tyr Glu Gly Val His Val Cys Gly Gly Ser Leu Val
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Ser Glu Gln Trp Val Leu Ser Ala Ala His Cys Phe Pro Ser Glu
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His His Lys Glu Ala Tyr Glu Val Lys Leu Gly Ala His Gln Leu
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Asp Ser Tyr Ser Glu Asp Ala Lys Val Ser Thr Leu Lys Asp Ile
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Ile Pro His Pro Ser Tyr Leu Gln Glu Gly Ser Gln Gly Asp Ile
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Ala Leu Leu Gln Leu Ser Arg Pro Ile Thr Phe Ser Arg Tyr Ile
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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
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| Arg | Pro | Ile | Cys | Leu | Pro | Ala | Ala | Asn | Ala | Ser | Phe | Pro | Asn | Gly | 155 | 160 | 165 |
| Leu | His | Cys | Thr | Val | Thr | Gly | Trp | Gly | His | Val | Ala | Pro | Ser | Val | 170 | 175 | 180 |
| Ser | Leu | Leu | Thr | Pro | Lys | Pro | Leu | Gln | Gln | Leu | Glu | Val | Pro | Leu | 185 | 190 | 195 |
| Ile | Ser | Arg | Glu | Thr | Cys | Asn | Cys | Leu | Tyr | Asn | Ile | Asp | Ala | Lys | 200 | 205 | 210 |
| Pro | Glu | Glu | Pro | His | Phe | Val | Gln | Glu | Asp | Met | Val | Cys | Ala | Gly | 215 | 220 | 225 |
| Tyr | Val | Glu | Gly | Gly | Lys | Asp | Ala | Cys | Gln | Gly | Asp | Ser | Gly | Gly | 230 | 235 | 240 |
| Pro | Leu | Ser | Cys | Pro | Val | Glu | Gly | Leu | Trp | Tyr | Leu | Thr | Gly | Ile | 245 | 250 | 255 |
| Val | Ser | Trp | Gly | Asp | Ala | Cys | Gly | Ala | Arg | Asn | Arg | Pro | Gly | Val | 260 | 265 | 270 |
| Tyr | Thr | Leu | Ala | Ser | Ser | Tyr | Ala | Ser | Trp | Ile | Gln | Ser | Lys | Val | 275 | 280 | 285 |
| Thr | Glu | Leu | Gln | Pro | Arg | Val | Val | Pro | Gln | Thr | Gln | Glu | Ser | Gln | 290 | 295 | 300 |
| Pro | Asp | Ser | Asn | Leu | Cys | Gly | Ser | His | Leu | Ala | Phe | Ser | Ser | Ala | 305 | 310 | 315 |
| Pro | Ala | Gln | Gly | Leu | Leu | Arg | Pro | Ile | Leu | Phe | Leu | Pro | Leu | Gly | 320 | 325 | 330 |
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<211> 7650

<212> DNA

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 ttcttaaata aagatggttt ctcaacctgt tggggaaaaa aaaaaaaaaa 7650

<210> 10

<211> 1040

<212> PRT

<213> Homo sapien

<400> 10

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gly | Thr | Ala | Thr | Arg | Arg | Lys | Pro | His | Leu | Leu | Leu | Val | Ala |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Val | Ala | Leu | Val | Ser | Ser | Ser | Ala | Trp | Ser | Ser | Ala | Leu | Gly |
|     |     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Gln | Thr | Thr | Phe | Gly | Pro | Val | Phe | Glu | Asp | Gln | Pro | Leu | Ser |
|     |     |     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Val | Leu | Phe | Pro | Glu | Glu | Ser | Thr | Glu | Glu | Gln | Val | Leu | Leu | Ala |  |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| Cys | Arg | Ala | Arg | Ala | Ser | Pro | Pro | Ala | Thr | Tyr | Arg | Trp | Lys | Met |  |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
| Asn | Gly | Thr | Glu | Met | Lys | Leu | Glu | Pro | Gly | Ser | Arg | His | Gln | Leu |  |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| Val | Gly | Gly | Asn | Leu | Val | Ile | Met | Asn | Pro | Thr | Lys | Ala | Gln | Asp |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Ala | Gly | Val | Tyr | Gln | Cys | Leu | Ala | Ser | Asn | Pro | Val | Gly | Thr | Val |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Val | Ser | Arg | Glu | Ala | Ile | Leu | Arg | Phe | Gly | Phe | Leu | Gln | Glu | Phe |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Ser | Lys | Glu | Glu | Arg | Asp | Pro | Val | Lys | Ala | His | Glu | Gly | Trp | Gly |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Val | Met | Leu | Pro | Cys | Asn | Pro | Pro | Ala | His | Tyr | Pro | Gly | Leu | Ser |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Tyr | Arg | Trp | Leu | Leu | Asn | Glu | Phe | Pro | Asn | Phe | Ile | Pro | Thr | Asp |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Gly | Arg | His | Phe | Val | Ser | Gln | Thr | Thr | Gly | Asn | Leu | Tyr | Ile | Ala |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Arg | Thr | Asn | Ala | Ser | Asp | Leu | Gly | Asn | Tyr | Ser | Cys | Leu | Ala | Thr |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Ser | His | Met | Asp | Phe | Ser | Thr | Lys | Ser | Val | Phe | Ser | Lys | Phe | Ala |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Gln | Leu | Asn | Leu | Ala | Ala | Glu | Asp | Thr | Arg | Leu | Phe | Ala | Pro | Ser |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ile | Lys | Ala | Arg | Phe | Pro | Ala | Glu | Thr | Tyr | Ala | Leu | Val | Gly | Gln |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Gln | Val | Thr | Leu | Glu | Cys | Phe | Ala | Phe | Gly | Asn | Pro | Val | Pro | Arg |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Ile | Lys | Trp | Arg | Lys | Val | Asp | Gly | Ser | Leu | Ser | Pro | Gln | Trp | Thr |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Thr | Ala | Glu | Pro | Thr | Leu | Gln | Ile | Pro | Ser | Val | Ser | Phe | Glu | Asp |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Glu | Gly | Thr | Tyr | Glu | Cys | Glu | Ala | Glu | Asn | Ser | Lys | Gly | Arg | Asp |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Thr | Val | Gln | Gly | Arg | Ile | Ile | Val | Gln | Ala | Gln | Pro | Glu | Trp | Leu |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Lys | Val | Ile | Ser | Asp | Thr | Glu | Ala | Asp | Ile | Gly | Ser | Asn | Leu | Arg |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Gly | Cys | Ala | Ala | Ala | Gly | Lys | Pro | Arg | Pro | Thr | Val | Arg | Trp | 350 | 355 | 360 |
| Leu | Arg | Asn | Gly | Glu | Pro | Leu | Ala | Ser | Gln | Asn | Arg | Val | Glu | Val | 365 | 370 | 375 |
| Leu | Ala | Gly | Asp | Leu | Arg | Phe | Ser | Lys | Leu | Ser | Leu | Glu | Asp | Ser | 380 | 385 | 390 |
| Gly | Met | Tyr | Gln | Cys | Val | Ala | Glu | Asn | Lys | His | Gly | Thr | Ile | Tyr | 395 | 400 | 405 |
| Ala | Ser | Ala | Glu | Leu | Ala | Val | Gln | Ala | Leu | Ala | Pro | Asp | Phe | Arg | 410 | 415 | 420 |
| Leu | Asn | Pro | Val | Arg | Arg | Leu | Ile | Pro | Ala | Ala | Arg | Gly | Gly | Glu | 425 | 430 | 435 |
| Ile | Leu | Ile | Pro | Cys | Gln | Pro | Arg | Ala | Ala | Pro | Lys | Ala | Val | Val | 440 | 445 | 450 |
| Leu | Trp | Ser | Lys | Gly | Thr | Glu | Ile | Leu | Val | Asn | Ser | Ser | Arg | Val | 455 | 460 | 465 |
| Thr | Val | Thr | Pro | Asp | Gly | Thr | Leu | Ile | Ile | Arg | Asn | Ile | Ser | Arg | 470 | 475 | 480 |
| Ser | Asp | Glu | Gly | Lys | Tyr | Thr | Cys | Phe | Ala | Glu | Asn | Phe | Met | Gly | 485 | 490 | 495 |
| Lys | Ala | Asn | Ser | Thr | Gly | Ile | Leu | Ser | Val | Arg | Asp | Ala | Thr | Lys | 500 | 505 | 510 |
| Ile | Thr | Leu | Ala | Pro | Ser | Ser | Ala | Asp | Ile | Asn | Leu | Gly | Asp | Asn | 515 | 520 | 525 |
| Leu | Thr | Leu | Gln | Cys | His | Ala | Ser | His | Asp | Pro | Thr | Met | Asp | Leu | 530 | 535 | 540 |
| Thr | Phe | Thr | Trp | Thr | Leu | Asp | Asp | Phe | Pro | Ile | Asp | Phe | Asp | Lys | 545 | 550 | 555 |
| Pro | Gly | Gly | His | Tyr | Arg | Arg | Thr | Asn | Val | Lys | Glu | Thr | Ile | Gly | 560 | 565 | 570 |
| Asp | Leu | Thr | Ile | Leu | Asn | Ala | Gln | Leu | Arg | His | Gly | Gly | Lys | Tyr | 575 | 580 | 585 |
| Thr | Cys | Met | Ala | Gln | Thr | Val | Val | Asp | Ser | Ala | Ser | Lys | Glu | Ala | 590 | 595 | 600 |
| Thr | Val | Leu | Val | Arg | Gly | Pro | Pro | Gly | Pro | Pro | Gly | Gly | Val | Val | 605 | 610 | 615 |
| Val | Arg | Asp | Ile | Gly | Asp | Thr | Thr | Ile | Gln | Leu | Ser | Trp | Ser | Arg | 620 | 625 | 630 |
| Gly | Phe | Asp | Asn | His | Ser | Pro | Ile | Ala | Lys | Tyr | Thr | Leu | Gln | Ala | 635 | 640 | 645 |
| Arg | Thr | Pro | Pro | Ala | Gly | Lys | Trp | Lys | Gln | Val | Arg | Thr | Asn | Pro |     |     |     |

| 650 |     |     |     |     | 655 |     |     |     |     | 660 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Asn | Ile | Glu | Gly | Asn | Ala | Glu | Thr | Ala | Gln | Val | Leu | Gly | Leu |
|     |     |     |     | 665 |     |     |     |     |     |     |     |     |     | 675 |
| Thr | Pro | Trp | Met | Asp | Tyr | Glu | Phe | Arg | Val | Ile | Ala | Ser | Asn | Ile |
|     |     |     |     | 680 |     |     |     |     |     |     |     |     |     | 690 |
| Leu | Gly | Thr | Gly | Glu | Pro | Ser | Gly | Pro | Ser | Ser | Lys | Ile | Arg | Thr |
|     |     |     |     | 695 |     |     |     |     |     |     |     |     |     | 705 |
| Arg | Glu | Ala | Ala | Pro | Ser | Val | Ala | Pro | Ser | Gly | Leu | Ser | Gly | Gly |
|     |     |     |     | 710 |     |     |     |     |     |     |     |     |     | 720 |
| Gly | Gly | Ala | Pro | Gly | Glu | Leu | Ile | Val | Asn | Trp | Thr | Pro | Met | Ser |
|     |     |     |     | 725 |     |     |     |     |     |     |     |     |     | 735 |
| Arg | Glu | Tyr | Gln | Asn | Gly | Asp | Gly | Phe | Gly | Tyr | Leu | Leu | Ser | Phe |
|     |     |     |     | 740 |     |     |     |     |     |     |     |     |     | 750 |
| Arg | Arg | Gln | Gly | Ser | Thr | His | Trp | Gln | Thr | Ala | Arg | Val | Pro | Gly |
|     |     |     |     | 755 |     |     |     |     |     |     |     |     |     | 765 |
| Ala | Asp | Ala | Gln | Tyr | Phe | Val | Tyr | Ser | Asn | Glu | Ser | Val | Arg | Pro |
|     |     |     |     | 770 |     |     |     |     |     |     |     |     |     | 780 |
| Tyr | Thr | Pro | Phe | Glu | Val | Lys | Ile | Arg | Ser | Tyr | Asn | Arg | Arg | Gly |
|     |     |     |     | 785 |     |     |     |     |     |     |     |     |     | 795 |
| Asp | Gly | Pro | Glu | Ser | Leu | Thr | Ala | Leu | Val | Tyr | Ser | Ala | Glu | Glu |
|     |     |     |     | 800 |     |     |     |     |     |     |     |     |     | 810 |
| Glu | Pro | Arg | Val | Ala | Pro | Thr | Lys | Val | Trp | Ala | Lys | Gly | Val | Ser |
|     |     |     |     | 815 |     |     |     |     |     |     |     |     |     | 825 |
| Ser | Ser | Glu | Met | Asn | Val | Thr | Trp | Glu | Pro | Val | Gln | Gln | Asp | Met |
|     |     |     |     | 830 |     |     |     |     |     |     |     |     |     | 840 |
| Asn | Gly | Ile | Leu | Leu | Gly | Tyr | Glu | Ile | Arg | Tyr | Trp | Lys | Ala | Gly |
|     |     |     |     | 845 |     |     |     |     |     |     |     |     |     | 855 |
| Asp | Lys | Glu | Ala | Ala | Ala | Asp | Arg | Val | Arg | Thr | Ala | Gly | Leu | Asp |
|     |     |     |     | 860 |     |     |     |     |     |     |     |     |     | 870 |
| Thr | Ser | Ala | Arg | Val | Ser | Gly | Leu | His | Pro | Asn | Thr | Lys | Tyr | His |
|     |     |     |     | 875 |     |     |     |     |     |     |     |     |     | 885 |
| Val | Thr | Val | Arg | Ala | Tyr | Asn | Arg | Ala | Gly | Thr | Gly | Pro | Ala | Ser |
|     |     |     |     | 890 |     |     |     |     |     |     |     |     |     | 900 |
| Pro | Ser | Ala | Asn | Ala | Thr | Thr | Met | Lys | Pro | Pro | Pro | Arg | Arg | Pro |
|     |     |     |     | 905 |     |     |     |     |     |     |     |     |     | 915 |
| Pro | Gly | Asn | Ile | Ser | Trp | Thr | Phe | Ser | Ser | Ser | Ser | Leu | Ser | Ile |
|     |     |     |     | 920 |     |     |     |     |     |     |     |     |     | 930 |
| Lys | Trp | Asp | Pro | Val | Val | Pro | Phe | Arg | Asn | Glu | Ser | Ala | Val | Thr |
|     |     |     |     | 935 |     |     |     |     |     |     |     |     |     | 945 |
| Gly | Tyr | Lys | Met | Leu | Tyr | Gln | Asn | Asp | Leu | His | Leu | Thr | Pro | Thr |
|     |     |     |     | 950 |     |     |     |     |     |     |     |     |     | 960 |



Leu His Leu Thr Gly Lys Asn Trp Ile Glu Ile Pro Val Pro Glu  
 965 970 975  
 Asp Ile Gly His Ala Leu Val Gln Ile Arg Thr Thr Gly Pro Gly  
 980 985 990  
 Gly Asp Gly Ile Pro Ala Glu Val His Ile Val Arg Asn Gly Gly  
 995 1000 1005  
 Thr Ser Met Met Val Glu Asn Met Ala Val Arg Pro Ala Pro His  
 1010 1015 1020  
 Pro Gly Thr Val Ile Ser His Ser Val Ala Met Leu Ile Leu Ile  
 1025 1030 1035  
 Gly Ser Leu Glu Leu  
 1040

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 <211> 1168  
 <212> DNA  
 <213> Homo sapien

<400> 11  
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 tctgagctcc agcctcaagg ctgtcccccg acccgtagc cgctgcctat 150  
 gtaggcagca ccggcccgtc cagctatgtg cacctcatcg cacctgccgg 200  
 gaggccttgg atgttctggc caagacagtg gccttcctca ggaacctgcc 250  
 atccttctgg cagctgcctc cccaggacca gcggcggctg ctgcagggtt 300  
 gctgggggcc cctcttctcg cttgggttgg cccaagatgc tgtgaccttt 350  
 gaggtggctg aggccccggt gccagcata ctcaagaaga ttctgctgga 400  
 ggagcccagc agcagtggag gcagtggcca actgccagac agaccccagc 450  
 cctccctggc tgcggtgcag tggcttcaat gctgtctgga gtccttctgg 500  
 agcctggagc ttagcccaa ggaatatgcc tgcctgaaag ggaccatcct 550  
 cttcaacccc gatgtgccag gcctccaagc cgctccac attgggcacc 600  
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 caagtccatt ccgaccagcc tgcttgggga cctcttcttt cgccctatca 750  
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 tgattcagcc tggccatccc cagaggtgac ccaatgctcc tggaggggca 900

agcctgtata gacagcactt ggctccttag gaacagctct tcactcagcc 950  
 acaccccaca ttggacttcc ttggtttgga cacagtgtc cagctgcctg 1000  
 ggaggctttt ggtgggtccc acagcctctg ggccaagact cctgtccctt 1050  
 cttgggatga gaatgaaagc ttaggctgct tattggacca gaagtcctat 1100  
 cgactttata cagaactgaa ttaagttatt gatttttgta ataaaaggta 1150  
 tgaaacacta aaaaaaaaa 1168

<210> 12  
 <211> 257  
 <212> PRT  
 <213> Homo sapien

<400> 12  
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 Ala Val Pro Arg Pro Arg Ser Arg Cys Leu Cys Arg Gln His Arg  
 35 40 45  
 Pro Val Gln Leu Cys Ala Pro His Arg Thr Cys Arg Glu Ala Leu  
 50 55 60  
 Asp Val Leu Ala Lys Thr Val Ala Phe Leu Arg Asn Leu Pro Ser  
 65 70 75  
 Phe Trp Gln Leu Pro Pro Gln Asp Gln Arg Arg Leu Leu Gln Gly  
 80 85 90  
 Cys Trp Gly Pro Leu Phe Leu Leu Gly Leu Ala Gln Asp Ala Val  
 95 100 105  
 Thr Phe Glu Val Ala Glu Ala Pro Val Pro Ser Ile Leu Lys Lys  
 110 115 120  
 Ile Leu Leu Glu Glu Pro Ser Ser Ser Gly Gly Ser Gly Gln Leu  
 125 130 135  
 Pro Asp Arg Pro Gln Pro Ser Leu Ala Ala Val Gln Trp Leu Gln  
 140 145 150  
 Cys Cys Leu Glu Ser Phe Trp Ser Leu Glu Leu Ser Pro Lys Glu  
 155 160 165  
 Tyr Ala Cys Leu Lys Gly Thr Ile Leu Phe Asn Pro Asp Val Pro  
 170 175 180  
 Gly Leu Gln Ala Ala Ser His Ile Gly His Leu Gln Gln Glu Ala  
 185 190 195  
 His Trp Val Leu Cys Glu Val Leu Glu Pro Trp Cys Pro Ala Ala  
 200 205 210  
 Gln Gly Arg Leu Thr Arg Val Leu Leu Thr Ala Ser Thr Leu Lys

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |     | 225 |
| Ser | Ile | Pro | Thr | Ser | Leu | Leu | Gly | Asp | Leu | Phe | Phe | Arg | Pro | Ile |     |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |     |
| Ile | Gly | Asp | Val | Asp | Ile | Ala | Gly | Leu | Leu | Gly | Asp | Met | Leu | Leu |     |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |

Leu Arg

<210> 13  
 <211> 1998  
 <212> DNA  
 <213> Homo sapien

<400> 13  
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 agaccccgcc gtgggaccca gcccgcaacg actcgctgcc gccacgctg 150  
 accccggccg tgcccccta cgtgaagctt ggccacacg tcgtctacac 200  
 cgtgttctac gcgctgctct tcgtgttcat ctacgtgcag ctctggctgg 250  
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 caaagacttc gtggcgcca attcgctcag ccccttcgtc ttctggctgc 400  
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 ttgttttctt gttggtgaat ttaacctgtg ctgtgctggt aaagacggga 600  
 aattgggaga ggaagggttat cgtctctgtg cgagtggcca ttaatgacac 650  
 gctcttcgtg ctgtgtgccg tctctctctc catctgtctc tacaaaatct 700  
 ctaagatgtc cttagccaac atttacttgg agtccaaggg ctccctccgtg 750  
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 ggccctgctac aacctgttca tcctgtcatt ttctcagaac aagagcgtcc 850  
 attcctttga ttatgactgg tacaatgtat cagaccaggc agatttgaag 900  
 aatcagctgg gagatgctgg atacgtatta tttggagtgg tgttatttgt 950  
 ttgggaactc ttacctacca ccttagtcgt ttatttcttc cgagttagaa 1000  
 atcctacaaa ggaccttacc aaccctggaa tgggtcccag ccatggattc 1050  
 agtcccagat cttatttctt tgacaacct cgaagatatg acagtgatga 1100

tgaccttgcc tggaacattg cccctcaggg acttcagga ggttttgctc 1150  
 cagattacta tgattgggga caacaaacta acagcttcct ggcacaagca 1200  
 ggaactttgc aagactcaac tttggatcct gacaaaccaa gccttgggta 1250  
 gcatcagtta acagttttat ggacgattcc tcagatgaaa agcttcagaa 1300  
 aagcatagtg acagctgaat ttttagggca cttttcctta agaaatagaa 1350  
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 taatgtagac tgataaaccc ttatttttagt actaaagagg gagccttgct 1450  
 atttcagtgg gtataattta aactttttta agaaaatctg tactttttata 1500  
 aagatgtatt ttgtataact taaataataa tgctaaagta tactaggggtt 1550  
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 gtaaagcagc agactgtaag gtcttttagag attttttttt aagggttcagg 1850  
 ccgtaggttc ctcaaggaat ctcttaagtt ttgcccaaag actggtactt 1900  
 cttttcagta gggcgctaata gtatacacat taatgataag ttgataacat 1950  
 taaaaatgta gctgacttat cctatttaaac ctctcttgct atgttcac 1998

<210> 14  
 <211> 399  
 <212> PRT  
 <213> Homo sapien

<400> 14  
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 20 25 30  
 Pro Thr Leu Thr Pro Ala Val Pro Pro Tyr Val Lys Leu Gly Leu  
 35 40 45  
 Thr Val Val Tyr Thr Val Phe Tyr Ala Leu Leu Phe Val Phe Ile  
 50 55 60  
 Tyr Val Gln Leu Trp Leu Val Leu Arg Tyr Arg His Lys Arg Leu  
 65 70 75  
 Ser Tyr Gln Ser Val Phe Leu Phe Leu Cys Leu Phe Trp Ala Ser  
 80 85 90  
 Leu Arg Thr Val Leu Phe Ser Phe Tyr Phe Lys Asp Phe Val Ala

|                 | 95      |                 | 100     |                 | 105     |
|-----------------|---------|-----------------|---------|-----------------|---------|
| Ala Asn Ser Leu | Ser 110 | Pro Phe Val Phe | Trp 115 | Leu Leu Tyr Cys | Phe 120 |
| Pro Val Cys Leu | Gln 125 | Phe Phe Thr Leu | Thr 130 | Leu Met Asn Leu | Tyr 135 |
| Phe Thr Gln Val | Ile 140 | Phe Lys Ala Lys | Ser 145 | Lys Tyr Ser Pro | Glu 150 |
| Leu Leu Lys Tyr | Arg 155 | Leu Pro Leu Tyr | Leu 160 | Ala Ser Leu Phe | Ile 165 |
| Ser Leu Val Phe | Leu 170 | Leu Val Asn Leu | Thr 175 | Cys Ala Val Leu | Val 180 |
| Lys Thr Gly Asn | Trp 185 | Glu Arg Lys Val | Ile 190 | Val Ser Val Arg | Val 195 |
| Ala Ile Asn Asp | Thr 200 | Leu Phe Val Leu | Cys 205 | Ala Val Ser Leu | Ser 210 |
| Ile Cys Leu Tyr | Lys 215 | Ile Ser Lys Met | Ser 220 | Leu Ala Asn Ile | Tyr 225 |
| Leu Glu Ser Lys | Gly 230 | Ser Ser Val Cys | Gln 235 | Val Thr Ala Ile | Gly 240 |
| Val Thr Val Ile | Leu 245 | Leu Tyr Thr Ser | Arg 250 | Ala Cys Tyr Asn | Leu 255 |
| Phe Ile Leu Ser | Phe 260 | Ser Gln Asn Lys | Ser 265 | Val His Ser Phe | Asp 270 |
| Tyr Asp Trp Tyr | Asn 275 | Val Ser Asp Gln | Ala 280 | Asp Leu Lys Asn | Gln 285 |
| Leu Gly Asp Ala | Gly 290 | Tyr Val Leu Phe | Gly 295 | Val Val Leu Phe | Val 300 |
| Trp Glu Leu Leu | Pro 305 | Thr Thr Leu Val | Val 310 | Tyr Phe Phe Arg | Val 315 |
| Arg Asn Pro Thr | Lys 320 | Asp Leu Thr Asn | Pro 325 | Gly Met Val Pro | Ser 330 |
| His Gly Phe Ser | Pro 335 | Arg Ser Tyr Phe | Phe 340 | Asp Asn Pro Arg | Arg 345 |
| Tyr Asp Ser Asp | Asp 350 | Asp Leu Ala Trp | Asn 355 | Ile Ala Pro Gln | Gly 360 |
| Leu Gln Gly Gly | Phe 365 | Ala Pro Asp Tyr | Tyr 370 | Asp Trp Gly Gln | Gln 375 |
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Leu | Gly | Gly | Thr | Cys | Leu | Asn | Val | Gly | Cys | Ile | Pro | Ser | Lys | Ala |  |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| Leu | Leu | Asn | Asn | Ser | His | Tyr | Tyr | His | Met | Ala | His | Gly | Thr | Asp |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Phe | Ala | Ser | Arg | Gly | Ile | Glu | Met | Ser | Glu | Val | Arg | Leu | Asn | Leu |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Asp | Lys | Met | Met | Glu | Gln | Lys | Ser | Thr | Ala | Val | Lys | Ala | Leu | Thr |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Gly | Gly | Ile | Ala | His | Leu | Phe | Lys | Gln | Asn | Lys | Val | Val | His | Val |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Asn | Gly | Tyr | Gly | Lys | Ile | Thr | Gly | Lys | Asn | Gln | Val | Thr | Ala | Thr |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Lys | Ala | Asp | Gly | Gly | Thr | Gln | Val | Ile | Asp | Thr | Lys | Asn | Ile | Leu |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Ile | Ala | Thr | Gly | Ser | Glu | Val | Thr | Pro | Phe | Pro | Gly | Ile | Thr | Ile |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Asp | Glu | Asp | Thr | Ile | Val | Ser | Ser | Thr | Gly | Ala | Leu | Ser | Leu | Lys |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Lys | Val | Pro | Glu | Lys | Met | Val | Val | Ile | Gly | Ala | Gly | Val | Ile | Gly |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Val | Glu | Leu | Gly | Ser | Val | Trp | Gln | Arg | Leu | Gly | Ala | Asp | Val | Thr |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ala | Val | Glu | Phe | Leu | Gly | His | Val | Gly | Gly | Val | Gly | Ile | Asp | Met |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Glu | Ile | Ser | Lys | Asn | Phe | Gln | Arg | Ile | Leu | Gln | Lys | Gln | Gly | Phe |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Lys | Phe | Lys | Leu | Asn | Thr | Lys | Val | Thr | Gly | Ala | Thr | Lys | Lys | Ser |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Asp | Gly | Lys | Ile | Asp | Val | Ser | Ile | Glu | Ala | Ala | Ser | Gly | Gly | Lys |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Ala | Glu | Val | Ile | Thr | Cys | Asp | Val | Leu | Leu | Val | Cys | Ile | Gly | Arg |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Arg | Pro | Phe | Thr | Lys | Asn | Leu | Gly | Leu | Glu | Glu | Leu | Gly | Ile | Glu |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Leu | Asp | Pro | Arg | Gly | Arg | Ile | Pro | Val | Asn | Thr | Arg | Phe | Gln | Thr |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Lys | Ile | Pro | Asn | Ile | Tyr | Ala | Ile | Gly | Asp | Val | Val | Ala | Gly | Pro |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Met | Leu | Ala | His | Lys | Ala | Glu | Asp | Glu | Gly | Ile | Ile | Cys | Val | Glu |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Gly | Met | Ala | Gly | Gly | Ala | Val | His | Ile | Asp | Tyr | Asn | Cys | Val | Pro |  |



| 380 |     |     |     |     |     |     |     |     |     | 385 |     |     |     |     | 390 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Ser | Val | Ile | Tyr | Thr | His | Pro | Glu | Val | Ala | Trp | Val | Gly | Lys | Ser |     |  |  |  |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |     |  |  |  |  |
| Glu | Glu | Gln | Leu | Lys | Glu | Glu | Gly | Ile | Glu | Tyr | Lys | Val | Gly | Lys |     |  |  |  |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |     |  |  |  |  |
| Phe | Pro | Phe | Ala | Ala | Asn | Ser | Arg | Ala | Lys | Thr | Asn | Ala | Asp | Thr |     |  |  |  |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |     |  |  |  |  |
| Asp | Gly | Met | Val | Lys | Ile | Leu | Gly | Gln | Lys | Ser | Thr | Asp | Arg | Val |     |  |  |  |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |     |  |  |  |  |
| Leu | Gly | Ala | His | Ile | Leu | Gly | Pro | Gly | Ala | Gly | Glu | Met | Val | Asn |     |  |  |  |  |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |     |  |  |  |  |
| Glu | Ala | Ala | Leu | Ala | Leu | Glu | Tyr | Gly | Ala | Ser | Cys | Glu | Asp | Ile |     |  |  |  |  |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |     |  |  |  |  |
| Ala | Arg | Val | Cys | His | Ala | His | Pro | Thr | Leu | Ser | Glu | Ala | Phe | Arg |     |  |  |  |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |  |  |  |  |
| Glu | Ala | Asn | Leu | Ala | Ala | Ser | Phe | Gly | Lys | Ser | Ile | Asn | Phe |     |     |  |  |  |  |
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<213> Homo sapien

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| Met | Val | Gly | Arg | Glu | Lys | Glu | Leu | Ser | Ile | His | Phe | Val | Pro | Gly | 1   | 5   | 10  | 15 |
| Ser | Cys | Arg | Leu | Val | Glu | Glu | Glu | Val | Asn | Ile | Pro | Asn | Arg | Arg | 20  | 25  | 30  |    |
| Val | Leu | Val | Thr | Gly | Ala | Thr | Gly | Leu | Leu | Gly | Arg | Ala | Val | His | 35  | 40  | 45  |    |
| Lys | Glu | Phe | Gln | Gln | Asn | Asn | Trp | His | Ala | Val | Gly | Cys | Gly | Phe | 50  | 55  | 60  |    |
| Arg | Arg | Ala | Arg | Pro | Lys | Phe | Glu | Gln | Val | Asn | Leu | Leu | Asp | Ser | 65  | 70  | 75  |    |
| Asn | Ala | Val | His | His | Ile | Ile | His | Asp | Phe | Gln | Pro | His | Val | Ile | 80  | 85  | 90  |    |
| Val | His | Cys | Ala | Ala | Glu | Arg | Arg | Pro | Asp | Val | Val | Glu | Asn | Gln | 95  | 100 | 105 |    |
| Pro | Asp | Ala | Ala | Ser | Gln | Leu | Asn | Val | Asp | Ala | Ser | Gly | Asn | Leu | 110 | 115 | 120 |    |
| Ala | Lys | Glu | Ala | Ala | Ala | Val | Gly | Ala | Phe | Leu | Ile | Tyr | Ile | Ser | 125 | 130 | 135 |    |
| Ser | Asp | Tyr | Val | Phe | Asp | Gly | Thr | Asn | Pro | Pro | Tyr | Arg | Glu | Glu | 140 | 145 | 150 |    |
| Asp | Ile | Pro | Ala | Pro | Leu | Asn | Leu | Tyr | Gly | Lys | Thr | Lys | Leu | Asp | 155 | 160 | 165 |    |
| Gly | Glu | Lys | Ala | Val | Leu | Glu | Asn | Asn | Leu | Gly | Ala | Ala | Val | Leu | 170 | 175 | 180 |    |
| Arg | Ile | Pro | Ile | Leu | Tyr | Gly | Glu | Val | Glu | Lys | Leu | Glu | Glu | Ser | 185 | 190 | 195 |    |
| Ala | Val | Thr | Val | Met | Phe | Asp | Lys | Val | Gln | Phe | Ser | Asn | Lys | Ser | 200 | 205 | 210 |    |
| Ala | Asn | Met | Asp | His | Trp | Gln | Gln | Arg | Phe | Pro | Thr | His | Val | Lys | 215 | 220 | 225 |    |
| Asp | Val | Ala | Thr | Val | Cys | Arg | Gln | Leu | Ala | Glu | Lys | Arg | Met | Leu | 230 | 235 | 240 |    |
| Asp | Pro | Ser | Ile | Lys | Gly | Thr | Phe | His | Trp | Ser | Gly | Asn | Glu | Gln | 245 | 250 | 255 |    |
| Met | Thr | Lys | Tyr | Glu | Met | Ala | Cys | Ala | Ile | Ala | Asp | Ala | Phe | Asn | 260 | 265 | 270 |    |
| Leu | Pro | Ser | Ser | His | Leu | Arg | Pro | Ile | Thr | Asp | Ser | Pro | Val | Leu | 275 | 280 | 285 |    |
| Gly | Ala | Gln | Arg | Pro | Arg | Asn | Ala | Gln | Leu | Asp | Cys | Ser | Lys | Leu | 290 | 295 | 300 |    |
| Glu | Thr | Leu | Gly | Ile | Gly | Gln | Arg | Thr | Pro | Phe | Arg | Ile | Gly | Ile |     |     |     |    |

|   |     |  |     |  |     |
|---|-----|--|-----|--|-----|
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| Thr Val Phe His   |     |  |     |  |     |

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<210> 20
<211> 302
<212> PRT
<213> Homo sapien

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<400> 20
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  1             5             10             15
Leu Ala Thr Phe Asp Pro Ala Arg Gly Thr Asp Ala Thr Asn Pro
             20             25             30

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Glu | Gly | Pro | Gln | Asp | Arg | Ser | Ser | Gln | Gln | Lys | Gly | Arg | Leu | 35  | 40  | 45  |
| Ser | Leu | Gln | Asn | Thr | Ala | Glu | Ile | Gln | His | Cys | Leu | Val | Asn | Ala | 50  | 55  | 60  |
| Gly | Asp | Val | Gly | Cys | Gly | Val | Phe | Glu | Cys | Phe | Glu | Asn | Asn | Ser | 65  | 70  | 75  |
| Cys | Glu | Ile | Arg | Gly | Leu | His | Gly | Ile | Cys | Met | Thr | Phe | Leu | His | 80  | 85  | 90  |
| Asn | Ala | Gly | Lys | Phe | Asp | Ala | Gln | Gly | Lys | Ser | Phe | Ile | Lys | Asp | 95  | 100 | 105 |
| Ala | Leu | Lys | Cys | Lys | Ala | His | Ala | Leu | Arg | His | Arg | Phe | Gly | Cys | 110 | 115 | 120 |
| Ile | Ser | Arg | Lys | Cys | Pro | Ala | Ile | Arg | Glu | Met | Val | Ser | Gln | Leu | 125 | 130 | 135 |
| Gln | Arg | Glu | Cys | Tyr | Leu | Lys | His | Asp | Leu | Cys | Ala | Ala | Ala | Gln | 140 | 145 | 150 |
| Glu | Asn | Thr | Arg | Val | Ile | Val | Glu | Met | Ile | His | Phe | Lys | Asp | Leu | 155 | 160 | 165 |
| Leu | Leu | His | Glu | Pro | Tyr | Val | Asp | Leu | Val | Asn | Leu | Leu | Leu | Thr | 170 | 175 | 180 |
| Cys | Gly | Glu | Glu | Val | Lys | Glu | Ala | Ile | Thr | His | Ser | Val | Gln | Val | 185 | 190 | 195 |
| Gln | Cys | Glu | Gln | Asn | Trp | Gly | Ser | Leu | Cys | Ser | Ile | Leu | Ser | Phe | 200 | 205 | 210 |
| Cys | Thr | Ser | Ala | Ile | Gln | Lys | Pro | Pro | Thr | Ala | Pro | Pro | Glu | Arg | 215 | 220 | 225 |
| Gln | Pro | Gln | Val | Asp | Arg | Thr | Lys | Leu | Ser | Arg | Ala | His | His | Gly | 230 | 235 | 240 |
| Glu | Ala | Gly | His | His | Leu | Pro | Glu | Pro | Ser | Ser | Arg | Glu | Thr | Gly | 245 | 250 | 255 |
| Arg | Gly | Ala | Lys | Gly | Glu | Arg | Gly | Ser | Lys | Ser | His | Pro | Asn | Ala | 260 | 265 | 270 |
| His | Ala | Arg | Gly | Arg | Val | Gly | Gly | Leu | Gly | Ala | Gln | Gly | Pro | Ser | 275 | 280 | 285 |
| Gly | Ser | Ser | Glu | Trp | Glu | Asp | Glu | Gln | Ser | Glu | Tyr | Ser | Asp | Ile | 290 | 295 | 300 |

Arg Arg

<210> 21  
 <211> 2516  
 <212> DNA  
 <213> Homo sapien

<400> 21

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<210> 22

<211> 528

<212> PRT

<213> Homo sapien

<400> 22

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Gly | Pro | Trp | Val | Leu | Leu | Leu | Leu | Gly | Leu | Arg | Leu | Gln |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Leu | Gly | Val | Ile | Pro | Ala | Glu | Glu | Glu | Asn | Pro | Ala | Phe |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Asn | Arg | Gln | Ala | Ala | Glu | Ala | Leu | Asp | Ala | Ala | Lys | Lys | Leu |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Pro | Ile | Gln | Lys | Val | Ala | Lys | Asn | Leu | Ile | Leu | Phe | Leu | Gly |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Gly | Leu | Gly | Val | Pro | Thr | Val | Thr | Ala | Thr | Arg | Ile | Leu | Lys | 65  | 70  | 75  |
| Gly | Gln | Lys | Asn | Gly | Lys | Leu | Gly | Pro | Glu | Thr | Pro | Leu | Ala | Met | 80  | 85  | 90  |
| Asp | Arg | Phe | Pro | Tyr | Leu | Ala | Leu | Ser | Lys | Thr | Tyr | Asn | Val | Asp | 95  | 100 | 105 |
| Arg | Gln | Val | Pro | Asp | Ser | Ala | Ala | Thr | Ala | Thr | Ala | Tyr | Leu | Cys | 110 | 115 | 120 |
| Gly | Val | Lys | Ala | Asn | Phe | Gln | Thr | Ile | Gly | Leu | Ser | Ala | Ala | Ala | 125 | 130 | 135 |
| Arg | Phe | Asn | Gln | Cys | Asn | Thr | Thr | Arg | Gly | Asn | Glu | Val | Ile | Ser | 140 | 145 | 150 |
| Val | Met | Asn | Arg | Ala | Lys | Gln | Ala | Gly | Lys | Ser | Val | Gly | Val | Val | 155 | 160 | 165 |
| Thr | Thr | Thr | Arg | Val | Gln | His | Ala | Ser | Pro | Ala | Gly | Thr | Tyr | Ala | 170 | 175 | 180 |
| His | Thr | Val | Asn | Arg | Asn | Trp | Tyr | Ser | Asp | Ala | Asp | Met | Pro | Ala | 185 | 190 | 195 |
| Ser | Ala | Arg | Gln | Glu | Gly | Cys | Gln | Asp | Ile | Ala | Thr | Gln | Leu | Ile | 200 | 205 | 210 |
| Ser | Asn | Met | Asp | Ile | Asp | Val | Ile | Leu | Gly | Gly | Gly | Arg | Lys | Tyr | 215 | 220 | 225 |
| Met | Phe | Pro | Met | Gly | Thr | Pro | Asp | Pro | Glu | Tyr | Pro | Ala | Asp | Ala | 230 | 235 | 240 |
| Ser | Gln | Asn | Gly | Ile | Arg | Leu | Asp | Gly | Lys | Asn | Leu | Val | Gln | Glu | 245 | 250 | 255 |
| Trp | Leu | Ala | Lys | His | Gln | Gly | Ala | Trp | Tyr | Val | Trp | Asn | Arg | Thr | 260 | 265 | 270 |
| Glu | Leu | Met | Gln | Ala | Ser | Leu | Asp | Gln | Ser | Val | Thr | His | Leu | Met | 275 | 280 | 285 |
| Gly | Leu | Phe | Glu | Pro | Gly | Asp | Thr | Lys | Tyr | Glu | Ile | Leu | Arg | Asp | 290 | 295 | 300 |
| Pro | Thr | Leu | Asp | Pro | Ser | Leu | Met | Glu | Met | Thr | Glu | Ala | Ala | Leu | 305 | 310 | 315 |
| Arg | Leu | Leu | Ser | Arg | Asn | Pro | Arg | Gly | Phe | Tyr | Leu | Phe | Val | Glu | 320 | 325 | 330 |
| Gly | Gly | Arg | Ile | Asp | His | Gly | His | His | Glu | Gly | Val | Ala | Tyr | Gln | 335 | 340 | 345 |
| Ala | Val | Thr | Glu | Ala | Val | Met | Phe | Asp | Asp | Ala | Ile | Glu | Arg | Ala | 350 | 355 | 360 |
| Gly | Gln | Leu | Thr | Ser | Glu | Glu | Asp | Thr | Leu | Thr | Leu | Val | Thr | Ala |     |     |     |

| 365         |     |     |     |     | 370 |     |     |     |     | 375 |     |     |     |     |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp         | His | Ser | His | Val | Phe | Ser | Phe | Gly | Gly | Tyr | Thr | Leu | Arg | Gly |
|             |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |
| Ser         | Ser | Ile | Phe | Gly | Leu | Ala | Pro | Ser | Lys | Ala | Gln | Asp | Ser | Lys |
|             |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |
| Ala         | Tyr | Thr | Ser | Ile | Leu | Tyr | Gly | Asn | Gly | Pro | Gly | Tyr | Val | Phe |
|             |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |
| Asn         | Ser | Gly | Val | Arg | Pro | Asp | Val | Asn | Glu | Ser | Glu | Ser | Gly | Ser |
|             |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |
| Pro         | Asp | Tyr | Gln | Gln | Gln | Ala | Ala | Val | Pro | Leu | Ser | Ser | Glu | Thr |
|             |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |
| His         | Gly | Gly | Glu | Asp | Val | Ala | Val | Phe | Ala | Arg | Gly | Pro | Gln | Ala |
|             |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |
| His         | Leu | Val | His | Gly | Val | Gln | Glu | Gln | Ser | Phe | Val | Ala | His | Val |
|             |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Met         | Ala | Phe | Ala | Ala | Cys | Leu | Glu | Pro | Tyr | Thr | Ala | Cys | Asp | Leu |
|             |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |
| Ala         | Leu | Pro | Ala | Cys | Thr | Thr | Asp | Ala | Ala | His | Pro | Val | Ala | Ala |
|             |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |
| Ser         | Leu | Pro | Leu | Leu | Ala | Gly | Thr | Leu | Leu | Leu | Leu | Gly | Ala | Ser |
|             |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |
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<210> 23  
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 <213> Homo sapien

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<212> PRT

<213> Homo sapien

<400> 24

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Pro | Thr | Ser | Gly | Pro | Glu | Glu | Ala | Arg | Arg | Pro | Ala | Ser |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ile | Arg | Val | Phe | Ala | Ser | Asn | Cys | Ser | Met | His | Gly | Leu | Gly |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     | 30  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Val | Phe | Gly | Pro | Gly | Ser | Leu | Ser | Leu | Arg | Arg | Gly | Met | Trp | 35  | 40  | 45  |
| Ala | Ala | Ala | Val | Val | Leu | Ser | Val | Ala | Thr | Phe | Leu | Tyr | Gln | Val | 50  | 55  | 60  |
| Ala | Glu | Arg | Val | Arg | Tyr | Tyr | Arg | Glu | Phe | His | His | Gln | Thr | Ala | 65  | 70  | 75  |
| Leu | Asp | Glu | Arg | Glu | Ser | His | Arg | Leu | Ile | Phe | Pro | Ala | Val | Thr | 80  | 85  | 90  |
| Leu | Cys | Asn | Ile | Asn | Pro | Leu | Arg | Arg | Ser | Arg | Leu | Thr | Pro | Asn | 95  | 100 | 105 |
| Asp | Leu | His | Trp | Ala | Gly | Ser | Ala | Leu | Leu | Gly | Leu | Asp | Pro | Ala | 110 | 115 | 120 |
| Glu | His | Ala | Ala | Phe | Leu | Arg | Ala | Leu | Gly | Arg | Pro | Pro | Ala | Pro | 125 | 130 | 135 |
| Pro | Gly | Phe | Met | Pro | Ser | Pro | Thr | Phe | Asp | Met | Ala | Gln | Leu | Tyr | 140 | 145 | 150 |
| Ala | Arg | Ala | Gly | His | Ser | Leu | Asp | Asp | Met | Leu | Leu | Asp | Cys | Arg | 155 | 160 | 165 |
| Phe | Arg | Gly | Gln | Pro | Cys | Gly | Pro | Glu | Asn | Phe | Thr | Thr | Ile | Phe | 170 | 175 | 180 |
| Thr | Arg | Met | Gly | Lys | Cys | Tyr | Thr | Phe | Asn | Ser | Gly | Ala | Asp | Gly | 185 | 190 | 195 |
| Ala | Glu | Leu | Leu | Thr | Thr | Thr | Arg | Gly | Gly | Met | Gly | Asn | Gly | Leu | 200 | 205 | 210 |
| Asp | Ile | Met | Leu | Asp | Val | Gln | Gln | Glu | Glu | Tyr | Leu | Pro | Val | Trp | 215 | 220 | 225 |
| Arg | Asp | Asn | Glu | Glu | Thr | Pro | Phe | Glu | Val | Gly | Ile | Arg | Val | Gln | 230 | 235 | 240 |
| Ile | His | Ser | Gln | Glu | Glu | Pro | Pro | Ile | Ile | Asp | Gln | Leu | Gly | Leu | 245 | 250 | 255 |
| Gly | Val | Ser | Pro | Gly | Tyr | Gln | Thr | Phe | Val | Ser | Cys | Gln | Gln | Gln | 260 | 265 | 270 |
| Gln | Leu | Ser | Phe | Leu | Pro | Pro | Pro | Trp | Gly | Asp | Cys | Ser | Ser | Ala | 275 | 280 | 285 |
| Ser | Leu | Asn | Pro | Asn | Tyr | Glu | Pro | Glu | Pro | Ser | Asp | Pro | Leu | Gly | 290 | 295 | 300 |
| Ser | Pro | Ser | Pro | Ser | Pro | Ser | Pro | Pro | Tyr | Thr | Leu | Met | Gly | Cys | 305 | 310 | 315 |
| Arg | Leu | Ala | Cys | Glu | Thr | Arg | Tyr | Val | Ala | Arg | Lys | Cys | Gly | Cys | 320 | 325 | 330 |

|                 |                     |                         |
|-----------------|---------------------|-------------------------|
| Arg Met Val Tyr | Met Pro Gly Asp Val | Pro Val Cys Ser Pro Gln |
| 335             |                     | 340 345                 |
| Gln Tyr Lys Asn | Cys Ala His Pro Ala | Ile Asp Ala Met Leu Arg |
| 350             |                     | 355 360                 |
| Lys Asp Ser Cys | Ala Cys Pro Asn Pro | Cys Ala Ser Thr Arg Tyr |
| 365             |                     | 370 375                 |
| Ala Lys Glu Leu | Ser Met Val Arg Ile | Pro Ser Arg Ala Ala Ala |
| 380             |                     | 385 390                 |
| Arg Phe Leu Ala | Arg Lys Leu Asn Arg | Ser Glu Ala Tyr Ile Ala |
| 395             |                     | 400 405                 |
| Glu Asn Val Leu | Ala Leu Asp Ile Phe | Phe Glu Ala Leu Asn Tyr |
| 410             |                     | 415 420                 |
| Glu Thr Val Glu | Gln Lys Lys Ala Tyr | Glu Met Ser Glu Leu Leu |
| 425             |                     | 430 435                 |
| Gly Asp Ile Gly | Gly Gln Met Gly Leu | Phe Ile Gly Ala Ser Leu |
| 440             |                     | 445 450                 |
| Leu Thr Ile Leu | Glu Ile Leu Asp Tyr | Leu Cys Glu Val Phe Arg |
| 455             |                     | 460 465                 |
| Asp Lys Val Leu | Gly Tyr Phe Trp Asn | Arg Gln His Ser Gln Arg |
| 470             |                     | 475 480                 |
| His Ser Ser Thr | Asn Leu Leu Gln Glu | Gly Leu Gly Ser His Arg |
| 485             |                     | 490 495                 |
| Thr Gln Val Pro | His Leu Ser Leu Gly | Pro Arg Pro Pro Thr Pro |
| 500             |                     | 505 510                 |
| Pro Cys Ala Val | Thr Lys Thr Leu Ser | Ala Ser His Arg Thr Cys |
| 515             |                     | 520 525                 |
| Tyr Leu Val Thr | Gln Leu             |                         |
| 530             |                     |                         |

<210> 25

<211> 1104

<212> DNA

<213> Homo sapien

<400> 25

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<211> 312

<212> PRT

<213> Homo sapien

<400> 26

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|-----|-----|----|
| Met | Arg | Met | Leu | Leu | Ala | Leu | Leu | Ala | Leu | Ser | Ala | Ala | Arg | Pro | 1  | 5   | 10  | 15 |
| Ser | Ala | Ser | Ala | Glu | Ser | His | Trp | Cys | Tyr | Glu | Val | Gln | Ala | Glu | 20 | 25  | 30  |    |
| Ser | Ser | Asn | Tyr | Pro | Cys | Leu | Val | Pro | Val | Lys | Trp | Gly | Gly | Asn | 35 | 40  | 45  |    |
| Cys | Gln | Lys | Asp | Arg | Gln | Ser | Pro | Ile | Asn | Ile | Val | Thr | Thr | Lys | 50 | 55  | 60  |    |
| Ala | Lys | Val | Asp | Lys | Lys | Leu | Gly | Arg | Phe | Phe | Phe | Ser | Gly | Tyr | 65 | 70  | 75  |    |
| Asp | Lys | Lys | Gln | Thr | Trp | Thr | Val | Gln | Asn | Asn | Gly | His | Ser | Val | 80 | 85  | 90  |    |
| Met | Met | Leu | Leu | Glu | Asn | Lys | Ala | Ser | Ile | Ser | Gly | Gly | Gly | Leu | 95 | 100 | 105 |    |
| Pro | Ala | Pro | Tyr | Gln | Ala | Lys | Gln | Leu | His | Leu | His | Trp | Ser | Asp |    |     |     |    |

| 110 |     |     |     |     | 115 |     |     |     |     | 120 |     |     |     |     |
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| Leu | Pro | Tyr | Lys | Gly | Ser | Glu | His | Ser | Leu | Asp | Gly | Glu | His | Phe |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Ala | Met | Glu | Met | His | Ile | Val | His | Glu | Lys | Glu | Lys | Gly | Thr | Ser |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Arg | Asn | Val | Lys | Glu | Ala | Gln | Asp | Pro | Glu | Asp | Glu | Ile | Ala | Val |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Leu | Ala | Phe | Leu | Val | Glu | Ala | Gly | Thr | Gln | Val | Asn | Glu | Gly | Phe |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Gln | Pro | Leu | Val | Glu | Ala | Leu | Ser | Asn | Ile | Pro | Lys | Pro | Glu | Met |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Ser | Thr | Thr | Met | Ala | Glu | Ser | Ser | Leu | Leu | Asp | Leu | Leu | Pro | Lys |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Glu | Glu | Lys | Leu | Arg | His | Tyr | Phe | Arg | Tyr | Leu | Gly | Ser | Leu | Thr |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Thr | Pro | Thr | Cys | Asp | Glu | Lys | Val | Val | Trp | Thr | Val | Phe | Arg | Glu |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Pro | Ile | Gln | Leu | His | Arg | Glu | Gln | Ile | Leu | Ala | Phe | Ser | Gln | Lys |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Leu | Tyr | Tyr | Asp | Lys | Glu | Gln | Thr | Val | Ser | Met | Lys | Asp | Asn | Val |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| Arg | Pro | Leu | Gln | Gln | Leu | Gly | Gln | Arg | Thr | Val | Ile | Lys | Ser | Gly |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Ala | Pro | Gly | Arg | Pro | Leu | Pro | Trp | Ala | Leu | Pro | Ala | Leu | Leu | Gly |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |
| Pro | Met | Leu | Ala | Cys | Leu | Leu | Ala | Gly | Phe | Leu | Arg |     |     |     |
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<211> 585

<212> DNA

<213> Homo sapien

<400> 27

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Asp Glu Leu Asp Lys Cys Cys Gln Thr His Asp Asn Cys Tyr Asp  
65 70 75  
Gln Ala Lys Lys Leu Asp Ser Cys Lys Phe Leu Leu Asp Asn Pro  
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Tyr Thr His Thr Tyr Ser Tyr Ser Cys Ser Gly Ser Ala Ile Thr  
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<211> 397

<212> PRT

<213> Homo sapien

<400> 30

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Arg | Ser | Pro | Ser | Ala | Ala | Trp | Leu | Leu | Gly | Ala | Ala | Ile | Leu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ala | Ala | Ser | Leu | Ser | Cys | Ser | Gly | Thr | Ile | Gln | Gly | Thr | Asn |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ser | Ser | Lys | Gly | Arg | Ser | Leu | Ile | Gly | Lys | Val | Asp | Gly | Thr |
|     |     |     | 35  |     |     |     |     | 40  |     |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ser | His | Val | Thr | Gly | Lys | Gly | Val | Thr | Val | Glu | Thr | Val | Phe | Ser |  |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| Val | Asp | Glu | Phe | Ser | Ala | Ser | Val | Leu | Thr | Gly | Lys | Leu | Thr | Thr |  |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
| Val | Phe | Leu | Pro | Ile | Val | Tyr | Thr | Ile | Val | Phe | Val | Val | Gly | Leu |  |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| Pro | Ser | Asn | Gly | Met | Ala | Leu | Trp | Val | Phe | Leu | Phe | Arg | Thr | Lys |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Lys | Lys | His | Pro | Ala | Val | Ile | Tyr | Met | Ala | Asn | Leu | Ala | Leu | Ala |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Asp | Leu | Leu | Ser | Val | Ile | Trp | Phe | Pro | Leu | Lys | Ile | Ala | Tyr | His |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Ile | His | Gly | Asn | Asn | Trp | Ile | Tyr | Gly | Glu | Ala | Leu | Cys | Asn | Val |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Leu | Ile | Gly | Phe | Phe | Tyr | Gly | Asn | Met | Tyr | Cys | Ser | Ile | Leu | Phe |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Met | Thr | Cys | Leu | Ser | Val | Gln | Arg | Tyr | Trp | Val | Ile | Val | Asn | Pro |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Met | Gly | His | Ser | Arg | Lys | Lys | Ala | Asn | Ile | Ala | Ile | Gly | Ile | Ser |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Leu | Ala | Ile | Trp | Leu | Leu | Ile | Leu | Leu | Val | Thr | Ile | Pro | Leu | Tyr |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Val | Val | Lys | Gln | Thr | Ile | Phe | Ile | Pro | Ala | Leu | Asn | Ile | Thr | Thr |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Cys | His | Asp | Val | Leu | Pro | Glu | Gln | Leu | Leu | Val | Gly | Asp | Met | Phe |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Asn | Tyr | Phe | Leu | Ser | Leu | Ala | Ile | Gly | Val | Phe | Leu | Phe | Pro | Ala |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Phe | Leu | Thr | Ala | Ser | Ala | Tyr | Val | Leu | Met | Ile | Arg | Met | Leu | Arg |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Ser | Ser | Ala | Met | Asp | Glu | Asn | Ser | Glu | Lys | Lys | Arg | Lys | Arg | Ala |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Ile | Lys | Leu | Ile | Val | Thr | Val | Leu | Ala | Met | Tyr | Leu | Ile | Cys | Phe |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Thr | Pro | Ser | Asn | Leu | Leu | Leu | Val | Val | His | Tyr | Phe | Leu | Ile | Lys |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Ser | Gln | Gly | Gln | Ser | His | Val | Tyr | Ala | Leu | Tyr | Ile | Val | Ala | Leu |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Cys | Leu | Ser | Thr | Leu | Asn | Ser | Cys | Ile | Asp | Pro | Phe | Val | Tyr | Tyr |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Phe | Val | Ser | His | Asp | Phe | Arg | Asp | His | Ala | Lys | Asn | Ala | Leu | Leu |  |

|                 |   |  |     |  |     |
|-----------------|---|--|-----|--|-----|
|                 | 350   |  | 355 |  | 360 |
| Cys Arg Ser Val | Arg Thr Val Lys Gln Met Gln Val Ser Leu Thr |  |     |  |     |
|                 | 365   |  | 370 |  | 375 |
| Ser Lys Lys His | Ser Arg Lys Ser Ser Ser Tyr Ser Ser Ser Ser |  |     |  |     |
|                 | 380   |  | 385 |  | 390 |
| Thr Thr Val Lys | Thr Ser Tyr                                 |  |     |  |     |
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| Phe | Asp | Val | Ser | His | Glu | His | Leu | Glu | Gly | Ala | Leu | Asp | Arg | Phe |     |  |  |  |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |     |  |  |  |  |
| Ala | Gln | Phe | Phe | Leu | Cys | Pro | Leu | Phe | Asp | Glu | Ser | Cys | Lys | Asp |     |  |  |  |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |     |  |  |  |  |
| Arg | Glu | Val | Asn | Ala | Val | Asp | Ser | Glu | His | Glu | Lys | Asn | Val | Met |     |  |  |  |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |     |  |  |  |  |
| Asn | Asp | Ala | Trp | Arg | Leu | Phe | Gln | Leu | Glu | Lys | Ala | Thr | Gly | Asn |     |  |  |  |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |     |  |  |  |  |
| Pro | Lys | His | Pro | Phe | Ser | Lys | Phe | Gly | Thr | Gly | Asn | Lys | Tyr | Thr |     |  |  |  |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |     |  |  |  |  |
| Leu | Glu | Thr | Arg | Pro | Asn | Gln | Glu | Gly | Ile | Asp | Val | Arg | Gln | Glu |     |  |  |  |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |     |  |  |  |  |
| Leu | Leu | Lys | Phe | His | Ser | Ala | Tyr | Tyr | Ser | Ser | Asn | Leu | Met | Ala |     |  |  |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |  |  |
| Val | Cys | Val | Leu | Gly | Arg | Glu | Ser | Leu | Asp | Asp | Leu | Thr | Asn | Leu |     |  |  |  |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |  |  |  |  |
| Val | Val | Lys | Leu | Phe | Ser | Glu | Val | Glu | Asn | Lys | Asn | Val | Pro | Leu |     |  |  |  |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |  |  |  |  |
| Pro | Glu | Phe | Pro | Glu | His | Pro | Phe | Gln | Glu | Glu | His | Leu | Lys | Gln |     |  |  |  |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |  |  |  |  |
| Leu | Tyr | Lys | Ile | Val | Pro | Ile | Lys | Asp | Ile | Arg | Asn | Leu | Tyr | Val |     |  |  |  |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |  |  |  |  |
| Thr | Phe | Pro | Ile | Pro | Asp | Leu | Gln | Lys | Tyr | Tyr | Lys | Ser | Asn | Pro |     |  |  |  |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |     |  |  |  |  |
| Gly | His | Tyr | Leu | Gly | His | Leu | Ile | Gly | His | Glu | Gly | Pro | Gly | Ser |     |  |  |  |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |     |  |  |  |  |
| Leu | Leu | Ser | Glu | Leu | Lys | Ser | Lys | Gly | Trp | Val | Asn | Thr | Leu | Val |     |  |  |  |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |     |  |  |  |  |
| Gly | Gly | Gln | Lys | Glu | Gly | Ala | Arg | Gly | Phe | Met | Phe | Phe | Ile | Ile |     |  |  |  |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |     |  |  |  |  |
| Asn | Val | Asp | Leu | Thr | Glu | Glu | Gly | Leu | Leu | His | Val | Glu | Asp | Ile |     |  |  |  |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |     |  |  |  |  |
| Ile | Leu | His | Met | Phe | Gln | Tyr | Ile | Gln | Lys | Leu | Arg | Ala | Glu | Gly |     |  |  |  |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |     |  |  |  |  |
| Pro | Gln | Glu | Trp | Val | Phe | Gln | Glu | Cys | Lys | Asp | Leu | Asn | Ala | Val |     |  |  |  |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |     |  |  |  |  |
| Ala | Phe | Arg | Phe | Lys | Asp | Lys | Glu | Arg | Pro | Arg | Gly | Tyr | Thr | Ser |     |  |  |  |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |     |  |  |  |  |
| Lys | Ile | Ala | Gly | Ile | Leu | His | Tyr | Tyr | Pro | Leu | Glu | Glu | Val | Leu |     |  |  |  |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |     |  |  |  |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ala | Glu | Tyr | Leu | Leu | Glu | Glu | Phe | Arg | Pro | Asp | Leu | Ile | Glu | 455 | 460 | 465 |
| Met | Val | Leu | Asp | Lys | Leu | Arg | Pro | Glu | Asn | Val | Arg | Val | Ala | Ile | 470 | 475 | 480 |
| Val | Ser | Lys | Ser | Phe | Glu | Gly | Lys | Thr | Asp | Arg | Thr | Glu | Glu | Trp | 485 | 490 | 495 |
| Tyr | Gly | Thr | Gln | Tyr | Lys | Gln | Glu | Ala | Ile | Pro | Asp | Glu | Val | Ile | 500 | 505 | 510 |
| Lys | Lys | Trp | Gln | Asn | Ala | Asp | Leu | Asn | Gly | Lys | Phe | Lys | Leu | Pro | 515 | 520 | 525 |
| Thr | Lys | Asn | Glu | Phe | Ile | Pro | Thr | Asn | Phe | Glu | Ile | Leu | Pro | Leu | 530 | 535 | 540 |
| Glu | Lys | Glu | Ala | Thr | Pro | Tyr | Pro | Ala | Leu | Ile | Lys | Asp | Thr | Val | 545 | 550 | 555 |
| Met | Ser | Lys | Leu | Trp | Phe | Lys | Gln | Asp | Asp | Lys | Lys | Lys | Lys | Pro | 560 | 565 | 570 |
| Lys | Ala | Cys | Leu | Asn | Phe | Glu | Phe | Phe | Ser | Pro | Phe | Ala | Tyr | Val | 575 | 580 | 585 |
| Asp | Pro | Leu | His | Cys | Asn | Met | Ala | Tyr | Leu | Tyr | Leu | Glu | Leu | Leu | 590 | 595 | 600 |
| Lys | Asp | Ser | Leu | Asn | Glu | Tyr | Ala | Tyr | Ala | Ala | Glu | Leu | Ala | Gly | 605 | 610 | 615 |
| Leu | Ser | Tyr | Asp | Leu | Gln | Asn | Thr | Ile | Tyr | Gly | Met | Tyr | Leu | Ser | 620 | 625 | 630 |
| Val | Lys | Gly | Tyr | Asn | Asp | Lys | Gln | Pro | Ile | Leu | Leu | Lys | Lys | Ile | 635 | 640 | 645 |
| Ile | Glu | Lys | Met | Ala | Thr | Phe | Glu | Ile | Asp | Glu | Lys | Arg | Phe | Glu | 650 | 655 | 660 |
| Ile | Ile | Lys | Glu | Ala | Tyr | Met | Arg | Ser | Leu | Asn | Asn | Phe | Arg | Ala | 665 | 670 | 675 |
| Glu | Gln | Pro | His | Gln | His | Ala | Met | Tyr | Tyr | Leu | Arg | Leu | Leu | Met | 680 | 685 | 690 |
| Thr | Glu | Val | Ala | Trp | Thr | Lys | Asp | Glu | Leu | Lys | Glu | Ala | Leu | Asp | 695 | 700 | 705 |
| Asp | Val | Thr | Leu | Pro | Arg | Leu | Lys | Ala | Phe | Ile | Pro | Gln | Leu | Leu | 710 | 715 | 720 |
| Ser | Arg | Leu | His | Ile | Glu | Ala | Leu | Leu | His | Gly | Asn | Ile | Thr | Lys | 725 | 730 | 735 |
| Gln | Ala | Ala | Leu | Gly | Ile | Met | Gln | Met | Val | Glu | Asp | Thr | Leu | Ile | 740 | 745 | 750 |



|                 |                     |                     |      |
|-----------------|---------------------|---------------------|------|
| Glu His Ala His | Thr Lys Pro Leu Leu | Pro Ser Gln Leu Val | Arg  |
|                 | 755                 | 760                 | 765  |
| Tyr Arg Glu Val | Gln Leu Pro Asp Arg | Gly Trp Phe Val Tyr | Gln  |
|                 | 770                 | 775                 | 780  |
| Gln Arg Asn Glu | Val His Asn Asn Cys | Gly Ile Glu Ile Tyr | Tyr  |
|                 | 785                 | 790                 | 795  |
| Gln Thr Asp Met | Gln Ser Thr Ser Glu | Asn Met Phe Leu Glu | Leu  |
|                 | 800                 | 805                 | 810  |
| Phe Cys Gln Ile | Ile Ser Glu Pro Cys | Phe Asn Thr Leu Arg | Thr  |
|                 | 815                 | 820                 | 825  |
| Lys Glu Gln Leu | Gly Tyr Ile Val Phe | Ser Gly Pro Arg Arg | Ala  |
|                 | 830                 | 835                 | 840  |
| Asn Gly Ile Gln | Ser Leu Arg Phe Ile | Ile Gln Ser Glu Lys | Pro  |
|                 | 845                 | 850                 | 855  |
| Pro His Tyr Leu | Glu Ser Arg Val Glu | Ala Phe Leu Ile Thr | Met  |
|                 | 860                 | 865                 | 870  |
| Glu Lys Ser Ile | Glu Asp Met Thr Glu | Glu Ala Phe Gln Lys | His  |
|                 | 875                 | 880                 | 885  |
| Ile Gln Ala Leu | Ala Ile Arg Arg Leu | Asp Lys Pro Lys Lys | Leu  |
|                 | 890                 | 895                 | 900  |
| Ser Ala Glu Cys | Ala Lys Tyr Trp Gly | Glu Ile Ile Ser Gln | Gln  |
|                 | 905                 | 910                 | 915  |
| Tyr Asn Phe Asp | Arg Asp Asn Thr Glu | Val Ala Tyr Leu Lys | Thr  |
|                 | 920                 | 925                 | 930  |
| Leu Thr Lys Glu | Asp Ile Ile Lys Phe | Tyr Lys Glu Met Leu | Ala  |
|                 | 935                 | 940                 | 945  |
| Val Asp Ala Pro | Arg Arg His Lys Val | Ser Val His Val Leu | Ala  |
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| Asn Asp Ile Asn | Leu Ser Gln Ala Pro | Ala Leu Pro Gln Pro | Glu  |
|                 | 980                 | 985                 | 990  |
| Val Ile Gln Asn | Met Thr Glu Phe Lys | Arg Gly Leu Pro Leu | Phe  |
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 35 40 45  
 Ile Ser Val Asn Pro Tyr Gln Gln Leu Pro Ile Tyr Gly Pro Glu  
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 Phe Ile Ala Lys Tyr Gln Asp Tyr Thr Phe Tyr Glu Leu Lys Pro  
 65 70 75  
 His Ile Tyr Ala Leu Ala Asn Val Ala Tyr Gln Ser Leu Arg Asp  
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 Arg Asp Arg Asp Gln Cys Ile Leu Ile Thr Gly Glu Ser Gly Ser  
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 Gly Lys Thr Glu Ala Ser Lys Leu Val Met Ser Tyr Val Ala Ala  
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 Ile Arg Asn Asn Asn Ser Ser Arg Phe Gly Lys Tyr Met Asp Ile  
 155 160 165

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Glu | Phe | Asp | Phe | Lys | Gly | Ser | Pro | Leu | Gly | Gly | Val | Ile | Thr | Asn |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Tyr | Leu | Leu | Glu | Lys | Ser | Arg | Leu | Val | Lys | Gln | Leu | Lys | Gly | Glu |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Arg | Asn | Phe | His | Ile | Phe | Tyr | Gln | Leu | Leu | Ala | Gly | Ala | Asp | Glu |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Gln | Leu | Leu | Lys | Ala | Leu | Lys | Leu | Glu | Arg | Asp | Thr | Thr | Gly | Tyr |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Ala | Tyr | Leu | Asn | His | Glu | Val | Ser | Arg | Val | Asp | Gly | Met | Asp | Asp |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ala | Ser | Ser | Phe | Arg | Ala | Val | Gln | Ser | Ala | Met | Ala | Val | Ile | Gly |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Phe | Ser | Glu | Glu | Glu | Ile | Arg | Gln | Val | Leu | Glu | Val | Thr | Ser | Met |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Val | Leu | Lys | Leu | Gly | Asn | Val | Leu | Val | Ala | Asp | Glu | Phe | Gln | Ala |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Ser | Gly | Ile | Pro | Ala | Ser | Gly | Ile | Arg | Asp | Gly | Arg | Gly | Val | Arg |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Glu | Ile | Gly | Glu | Met | Val | Gly | Leu | Asn | Ser | Glu | Glu | Val | Glu | Arg |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Ala | Leu | Cys | Ser | Arg | Thr | Met | Glu | Thr | Ala | Lys | Glu | Lys | Val | Val |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Thr | Ala | Leu | Asn | Val | Met | Gln | Ala | Gln | Tyr | Ala | Arg | Asp | Ala | Leu |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Ala | Lys | Asn | Ile | Tyr | Ser | Arg | Leu | Phe | Asp | Trp | Ile | Val | Asn | Arg |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Ile | Asn | Glu | Ser | Ile | Lys | Val | Gly | Ile | Gly | Glu | Lys | Lys | Lys | Val |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Met | Gly | Val | Leu | Asp | Ile | Tyr | Gly | Phe | Glu | Ile | Leu | Glu | Asp | Asn |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Ser | Phe | Glu | Gln | Phe | Val | Ile | Asn | Tyr | Cys | Asn | Glu | Lys | Leu | Gln |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Gln | Val | Phe | Ile | Glu | Met | Thr | Leu | Lys | Glu | Glu | Gln | Glu | Glu | Tyr |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |
| Lys | Arg | Glu | Gly | Ile | Pro | Trp | Thr | Lys | Val | Asp | Tyr | Phe | Asp | Asn |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |
| Gly | Ile | Ile | Cys | Lys | Leu | Ile | Glu | His | Asn | Gln | Arg | Gly | Ile | Leu |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |
| Ala | Met | Leu | Asp | Glu | Glu | Cys | Leu | Arg | Pro | Gly | Val | Val | Ser | Asp |  |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ser | Thr | Phe | Leu | Ala | Lys | Leu | Asn | Gln | Leu | Phe | Ser | Lys | His | Gly |  |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| His | Tyr | Glu | Ser | Lys | Val | Thr | Gln | Asn | Ala | Gln | Arg | Gln | Tyr | Asp |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |  |
| His | Thr | Met | Gly | Leu | Ser | Cys | Phe | Arg | Ile | Cys | His | Tyr | Ala | Gly |  |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |  |
| Lys | Val | Thr | Tyr | Asn | Val | Thr | Ser | Phe | Ile | Asp | Lys | Asn | Asn | Asp |  |
|     |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |  |
| Leu | Leu | Phe | Arg | Asp | Leu | Leu | Gln | Ala | Met | Trp | Lys | Ala | Gln | His |  |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |  |
| Pro | Leu | Leu | Arg | Ser | Leu | Phe | Pro | Glu | Gly | Asn | Pro | Lys | Gln | Ala |  |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |  |
| Ser | Leu | Lys | Arg | Pro | Pro | Thr | Ala | Gly | Ala | Gln | Phe | Lys | Ser | Ser |  |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |  |
| Val | Ala | Ile | Leu | Met | Lys | Asn | Leu | Tyr | Ser | Lys | Ser | Pro | Asn | Tyr |  |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |  |
| Ile | Arg | Cys | Ile | Lys | Pro | Asn | Glu | His | Gln | Gln | Arg | Gly | Gln | Phe |  |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |  |
| Ser | Ser | Asp | Leu | Val | Ala | Thr | Gln | Ala | Arg | Tyr | Leu | Gly | Leu | Leu |  |
|     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |  |
| Glu | Asn | Val | Arg | Val | Arg | Arg | Ala | Gly | Tyr | Ala | His | Arg | Gln | Gly |  |
|     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     | 630 |  |
| Tyr | Gly | Pro | Phe | Leu | Glu | Arg | Tyr | Arg | Leu | Leu | Ser | Arg | Ser | Thr |  |
|     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     | 645 |  |
| Trp | Pro | His | Trp | Asn | Gly | Gly | Asp | Arg | Glu | Gly | Val | Glu | Lys | Val |  |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |  |
| Leu | Gly | Glu | Leu | Ser | Met | Ser | Ser | Gly | Glu | Leu | Ala | Phe | Gly | Lys |  |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |  |
| Thr | Lys | Ile | Phe | Ile | Arg | Ser | Pro | Lys | Thr | Leu | Phe | Tyr | Leu | Glu |  |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |  |
| Glu | Gln | Arg | Arg | Leu | Arg | Leu | Gln | Gln | Leu | Ala | Thr | Leu | Ile | Gln |  |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |  |
| Lys | Ile | Tyr | Arg | Gly | Trp | Arg | Cys | Arg | Thr | His | Tyr | Gln | Leu | Met |  |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |  |
| Arg | Lys | Ser | Gln | Ile | Leu | Ile | Ser | Ser | Trp | Phe | Arg | Gly | Asn | Met |  |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |  |
| Gln | Lys | Lys | Cys | Tyr | Gly | Lys | Ile | Lys | Ala | Ser | Val | Leu | Leu | Ile |  |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |  |
| Gln | Ala | Phe | Val | Arg | Gly | Trp | Lys | Ala | Arg | Lys | Asn | Tyr | Arg | Lys |  |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |  |
| Tyr | Phe | Arg | Ser | Glu | Ala | Ala | Leu | Thr | Leu | Ala | Asp | Phe | Ile | Tyr |  |

| 770 |     |     |     |      | 775 |     |     |     |      | 780 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Lys | Ser | Met | Val | Gln  | Lys | Phe | Leu | Leu | Gly  | Leu | Lys | Asn | Asn | Leu  |
|     |     |     |     | 785  |     |     |     |     | 790  |     |     |     |     | 795  |
| Pro | Ser | Thr | Asn | Val  | Leu | Asp | Lys | Thr | Trp  | Pro | Ala | Ala | Pro | Tyr  |
|     |     |     |     | 800  |     |     |     |     | 805  |     |     |     |     | 810  |
| Lys | Cys | Leu | Ser | Thr  | Ala | Asn | Gln | Glu | Leu  | Gln | Gln | Leu | Phe | Tyr  |
|     |     |     |     | 815  |     |     |     |     | 820  |     |     |     |     | 825  |
| Gln | Trp | Lys | Cys | Lys  | Arg | Phe | Arg | Asp | Gln  | Leu | Ser | Pro | Lys | Gln  |
|     |     |     |     | 830  |     |     |     |     | 835  |     |     |     |     | 840  |
| Val | Glu | Ile | Leu | Arg  | Glu | Lys | Leu | Cys | Ala  | Ser | Glu | Leu | Phe | Lys  |
|     |     |     |     | 845  |     |     |     |     | 850  |     |     |     |     | 855  |
| Gly | Lys | Lys | Ala | Ser  | Tyr | Pro | Gln | Ser | Val  | Pro | Ile | Pro | Phe | Cys  |
|     |     |     |     | 860  |     |     |     |     | 865  |     |     |     |     | 870  |
| Gly | Asp | Tyr | Ile | Gly  | Leu | Gln | Gly | Asn | Pro  | Lys | Leu | Gln | Lys | Leu  |
|     |     |     |     | 875  |     |     |     |     | 880  |     |     |     |     | 885  |
| Lys | Gly | Gly | Glu | Glu  | Gly | Pro | Val | Leu | Met  | Ala | Glu | Ala | Val | Lys  |
|     |     |     |     | 890  |     |     |     |     | 895  |     |     |     |     | 900  |
| Lys | Val | Asn | Arg | Gly  | Asn | Gly | Lys | Thr | Ser  | Ser | Arg | Ile | Leu | Leu  |
|     |     |     |     | 905  |     |     |     |     | 910  |     |     |     |     | 915  |
| Leu | Thr | Lys | Gly | His  | Val | Ile | Leu | Thr | Asp  | Thr | Lys | Lys | Ser | Gln  |
|     |     |     |     | 920  |     |     |     |     | 925  |     |     |     |     | 930  |
| Ala | Lys | Ile | Val | Ile  | Gly | Leu | Asp | Asn | Val  | Ala | Gly | Val | Ser | Val  |
|     |     |     |     | 935  |     |     |     |     | 940  |     |     |     |     | 945  |
| Thr | Ser | Leu | Lys | Asp  | Gly | Leu | Phe | Ser | Leu  | His | Leu | Ser | Glu | Met  |
|     |     |     |     | 950  |     |     |     |     | 955  |     |     |     |     | 960  |
| Ser | Ser | Val | Gly | Ser  | Lys | Gly | Asp | Phe | Leu  | Leu | Val | Ser | Glu | His  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Val | Ile | Glu | Leu | Leu  | Thr | Lys | Met | Tyr | Arg  | Ala | Val | Leu | Asp | Ala  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Thr | Gln | Arg | Gln | Leu  | Thr | Val | Thr | Val | Thr  | Glu | Lys | Phe | Ser | Val  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Arg | Phe | Lys | Glu | Asn  | Ser | Val | Ala | Val | Lys  | Val | Val | Gln | Gly | Pro  |
|     |     |     |     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |
| Ala | Gly | Gly | Asp | Asn  | Ser | Lys | Leu | Arg | Tyr  | Lys | Lys | Lys | Gly | Ser  |
|     |     |     |     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |
| His | Cys | Leu | Glu | Val  | Thr | Val | Gln |     |      |     |     |     |     |      |
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<210> 35  
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 <212> DNA  
 <213> Homo sapien

<400> 35

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aggataatgt ttccttccat aaagaaagtt cttgtaagaa tcaaaagaaa 1800
tggtgagctt taagtggttt gtaaaccata aaacacatca taaaagttct 1850

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<210> 36

<211> 502

<212> PRT

<213> Homo sapien

<400> 36

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Met | Leu | Ala | Ala | Met | Gly | Ser | Leu | Ala | Ala | Ala | Leu | Trp | Ala | Val | 1   | 5   | 10  | 15 |
| Val | His | Pro | Arg | Thr | Leu | Leu | Leu | Gly | Thr | Val | Ala | Phe | Leu | Leu | 20  | 25  | 30  |    |
| Ala | Ala | Asp | Phe | Leu | Lys | Arg | Arg | Arg | Pro | Lys | Asn | Tyr | Pro | Pro | 35  | 40  | 45  |    |
| Gly | Pro | Trp | Arg | Leu | Pro | Phe | Leu | Gly | Asn | Phe | Phe | Leu | Val | Asp | 50  | 55  | 60  |    |
| Phe | Glu | Gln | Ser | His | Leu | Glu | Val | Gln | Leu | Phe | Val | Lys | Lys | Tyr | 65  | 70  | 75  |    |
| Gly | Asn | Leu | Phe | Ser | Leu | Glu | Leu | Gly | Asp | Ile | Ser | Ala | Val | Leu | 80  | 85  | 90  |    |
| Ile | Thr | Gly | Leu | Pro | Leu | Ile | Lys | Glu | Ala | Leu | Ile | His | Met | Asp | 95  | 100 | 105 |    |
| Gln | Asn | Phe | Gly | Asn | Arg | Pro | Val | Thr | Pro | Met | Arg | Glu | His | Ile | 110 | 115 | 120 |    |
| Phe | Lys | Lys | Asn | Gly | Leu | Ile | Met | Ser | Ser | Gly | Gln | Ala | Trp | Lys | 125 | 130 | 135 |    |
| Glu | Gln | Arg | Arg | Phe | Thr | Leu | Thr | Ala | Leu | Arg | Asn | Phe | Gly | Leu | 140 | 145 | 150 |    |
| Gly | Lys | Lys | Ser | Leu | Glu | Glu | Arg | Ile | Gln | Glu | Glu | Ala | Gln | His | 155 | 160 | 165 |    |
| Leu | Thr | Glu | Ala | Ile | Lys | Glu | Glu | Asn | Gly | Gln | Pro | Phe | Asp | Pro | 170 | 175 | 180 |    |
| His | Phe | Lys | Ile | Asn | Asn | Ala | Val | Ser | Asn | Ile | Ile | Cys | Ser | Ile | 185 | 190 | 195 |    |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Phe | Gly | Glu | Arg | Phe | Glu | Tyr | Gln | Asp | Ser | Trp | Phe | Gln | Gln | 200 | 205 | 210 |
| Leu | Leu | Lys | Leu | Leu | Asp | Glu | Val | Thr | Tyr | Leu | Glu | Ala | Ser | Lys | 215 | 220 | 225 |
| Thr | Cys | Gln | Leu | Tyr | Asn | Val | Phe | Pro | Trp | Ile | Met | Lys | Phe | Leu | 230 | 235 | 240 |
| Pro | Gly | Pro | His | Gln | Thr | Leu | Phe | Ser | Asn | Trp | Lys | Lys | Leu | Lys | 245 | 250 | 255 |
| Leu | Phe | Val | Ser | His | Met | Ile | Asp | Lys | His | Arg | Lys | Asp | Trp | Asn | 260 | 265 | 270 |
| Pro | Ala | Glu | Thr | Arg | Asp | Phe | Ile | Asp | Ala | Tyr | Leu | Lys | Glu | Met | 275 | 280 | 285 |
| Ser | Lys | His | Thr | Gly | Asn | Pro | Thr | Ser | Ser | Phe | His | Glu | Glu | Asn | 290 | 295 | 300 |
| Leu | Ile | Cys | Ser | Thr | Leu | Asp | Leu | Phe | Phe | Ala | Gly | Thr | Glu | Thr | 305 | 310 | 315 |
| Thr | Ser | Thr | Thr | Leu | Arg | Trp | Ala | Leu | Leu | Tyr | Met | Ala | Leu | Tyr | 320 | 325 | 330 |
| Pro | Glu | Ile | Gln | Glu | Lys | Val | Gln | Ala | Glu | Ile | Asp | Arg | Val | Ile | 335 | 340 | 345 |
| Gly | Gln | Gly | Gln | Gln | Pro | Ser | Thr | Ala | Ala | Arg | Glu | Ser | Met | Pro | 350 | 355 | 360 |
| Tyr | Thr | Asn | Ala | Val | Ile | His | Glu | Val | Gln | Arg | Met | Gly | Asn | Ile | 365 | 370 | 375 |
| Ile | Pro | Leu | Asn | Val | Pro | Arg | Glu | Val | Thr | Val | Asp | Thr | Thr | Leu | 380 | 385 | 390 |
| Ala | Gly | Tyr | His | Leu | Pro | Lys | Gly | Thr | Met | Ile | Leu | Thr | Asn | Leu | 395 | 400 | 405 |
| Thr | Ala | Leu | His | Arg | Asp | Pro | Thr | Glu | Trp | Ala | Thr | Pro | Asp | Thr | 410 | 415 | 420 |
| Phe | Asn | Pro | Asp | His | Phe | Leu | Glu | Asn | Gly | Gln | Phe | Lys | Lys | Arg | 425 | 430 | 435 |
| Glu | Ala | Phe | Met | Pro | Phe | Ser | Ile | Gly | Lys | Arg | Ala | Cys | Leu | Gly | 440 | 445 | 450 |
| Glu | Gln | Leu | Ala | Arg | Thr | Glu | Leu | Phe | Ile | Phe | Phe | Thr | Ser | Leu | 455 | 460 | 465 |
| Met | Gln | Lys | Phe | Thr | Phe | Arg | Pro | Pro | Asn | Asn | Glu | Lys | Leu | Ser | 470 | 475 | 480 |
| Leu | Lys | Phe | Arg | Met | Gly | Ile | Thr | Ile | Ser | Pro | Val | Ser | His | Arg | 485 | 490 | 495 |
| Leu | Cys | Ala | Val | Pro | Gln | Val |     |     |     |     |     |     |     |     |     |     |     |

<210> 37  
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 <212> DNA  
 <213> Homo sapien

<400> 37  
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<210> 38
<211> 338
<212> PRT
<213> Homo sapien

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          20          25          30

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          35          40          45

Tyr Thr Leu Asp Asn Asn Val Leu Thr Leu Glu Gln Arg Lys Phe
          50          55          60

Tyr Glu Glu Asn Gly Phe Leu Val Ile Lys Asn Leu Val Pro Asp
          65          70          75

Ala Asp Ile Gln Arg Phe Arg Asn Glu Phe Glu Lys Ile Cys Arg
          80          85          90

Lys Glu Val Lys Pro Leu Gly Leu Thr Val Met Arg Asp Val Thr
          95          100          105

Ile Ser Lys Ser Glu Tyr Ala Pro Ser Glu Lys Met Ile Thr Lys
          110          115          120

Val Gln Asp Phe Gln Glu Asp Lys Glu Leu Phe Arg Tyr Cys Thr
          125          130          135

Leu Pro Glu Ile Leu Lys Tyr Val Glu Cys Phe Thr Gly Pro Asn
          140          145          150

Ile Met Ala Met His Thr Met Leu Ile Asn Lys Pro Pro Asp Ser
          155          160          165

Gly Lys Lys Thr Ser Arg His Pro Leu His Gln Asp Leu His Tyr
          170          175          180

Phe Pro Phe Arg Pro Ser Asp Leu Ile Val Cys Ala Trp Thr Ala
          185          190          195

Met Glu His Ile Ser Arg Asn Asn Gly Cys Leu Val Val Leu Pro
          200          205          210

Gly Thr His Lys Gly Ser Leu Lys Pro His Asp Tyr Pro Lys Trp
          215          220          225

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Gly | Gly | Val | Asn | Lys | Met | Phe | His | Gly | Ile | Gln | Asp | Tyr | Glu | 230 | 235 | 240 |
| Glu | Asn | Lys | Ala | Arg | Val | His | Leu | Val | Met | Glu | Lys | Gly | Asp | Thr | 245 | 250 | 255 |
| Val | Phe | Phe | His | Pro | Leu | Leu | Ile | His | Gly | Ser | Gly | Gln | Asn | Lys | 260 | 265 | 270 |
| Thr | Gln | Gly | Phe | Arg | Lys | Ala | Ile | Ser | Cys | His | Phe | Ala | Ser | Ala | 275 | 280 | 285 |
| Asp | Cys | His | Tyr | Ile | Asp | Val | Lys | Gly | Thr | Ser | Gln | Glu | Asn | Ile | 290 | 295 | 300 |
| Glu | Lys | Glu | Val | Val | Gly | Ile | Ala | His | Lys | Phe | Phe | Gly | Ala | Glu | 305 | 310 | 315 |
| Asn | Ser | Val | Asn | Leu | Lys | Asp | Ile | Trp | Met | Phe | Arg | Ala | Arg | Leu | 320 | 325 | 330 |
| Val | Lys | Gly | Glu | Arg | Thr | Asn | Leu |     |     |     |     |     |     |     | 335 |     |     |

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 <212> DNA  
 <213> Homo sapien

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 ttaagggaac aagctggagg tgacgctact gagaactttg aggatgtcgg 200  
 gcactctaca gatgccaggg aaatgtccaa aacattcatc attggggagc 250  
 tccatccaga tgacagacca aagttaaaca agcctccaga accttaaagg 300  
 cgggtgtttca aggaaactct tatcactact attgattcta gttccagttg 350  
 gtggaccaac tgggtgatcc ctgccatctc tgcagtggcc gtcgccttga 400  
 tgtatcgcct atacatggca gaggactgaa cacctcctca gaagtcagcg 450  
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 ttcaactgac agaaaccttc acttgaaaac aatgatttta atatattctt 550  
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 cgctcaaatt tttcgagtgt gcctttttat tcattacttt tattttgatg 650  
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<210> 40  
 <211> 98  
 <212> PRT  
 <213> Homo sapien

<400> 40  
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                     20                    25                    30  
 His His Lys Val Tyr Asp Leu Thr Lys Phe Leu Glu Glu His Pro  
                     35                    40                    45  
 Gly Gly Glu Glu Val Leu Arg Glu Gln Ala Gly Gly Asp Ala Thr  
                     50                    55                    60  
 Glu Asn Phe Glu Asp Val Gly His Ser Thr Asp Ala Arg Glu Met  
                     65                    70                    75  
 Ser Lys Thr Phe Ile Ile Gly Glu Leu His Pro Asp Asp Arg Pro  
                     80                    85                    90  
 Lys Leu Asn Lys Pro Pro Glu Pro  
                     95

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 <211> 578  
 <212> DNA  
 <213> Homo sapien

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 ggattcagca ccatggcgga agacatggag accaaaatca agaactacaa 200  
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 <211> 86  
 <212> PRT  
 <213> Homo sapien

<400> 42

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Glu | Asp | Met | Glu | Thr | Lys | Ile | Lys | Asn | Tyr | Lys | Thr | Ala |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |
| Pro | Phe | Asp | Ser | Arg | Phe | Pro | Asn | Gln | Asn | Gln | Thr | Arg | Asn | Cys |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Trp | Gln | Asn | Tyr | Leu | Asp | Phe | His | Arg | Cys | Gln | Lys | Ala | Met | Thr |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Ala | Lys | Gly | Gly | Asp | Ile | Ser | Val | Cys | Glu | Trp | Tyr | Gln | Arg | Val |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Tyr | Gln | Ser | Leu | Cys | Pro | Thr | Ser | Trp | Val | Thr | Asp | Trp | Asp | Glu |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Gln | Arg | Ala | Glu | Gly | Thr | Phe | Pro | Gly | Lys | Ile |     |     |     |     |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     |     |

<210> 43

<211> 2444

<212> DNA

<213> Homo sapien

<400> 43

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gaagatctcc ccccccttcc cctcccctcc tccctctttt cccctcccca 150  
ggagaaaaag accccaagc agaaaaaagt tcaccttgga ctcgctctttt 200  
tcttgcaata ttttttgggg gggcaaaact ttgagggggg gatttttttt 250  
ggcttttctt cctccttcat ttttcttcca aaattgctgc tgggtgggtga 300  
aaaaaaaaatg ccgcagctga acggcgggtg aggggatgac ctaggcgcca 350  
acgacgaact gatttccttc aaagacgagg gcgaacagga ggagaagagc 400  
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<210> 44

<211> 596

<212> PRT

<213> Homo sapien

<400> 44

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Pro | Gln | Leu | Asn | Gly | Gly | Gly | Gly | Asp | Asp | Leu | Gly | Ala | Asn |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Glu | Leu | Ile | Ser | Phe | Lys | Asp | Glu | Gly | Glu | Gln | Glu | Glu | Lys |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ser | Glu | Asn | Ser | Ser | Ala | Glu | Arg | Asp | Leu | Ala | Asp | Val | Lys |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ser | Leu | Val | Asn | Glu | Ser | Glu | Thr | Asn | Gln | Asn | Ser | Ser | Ser |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ser | Glu | Ala | Glu | Arg | Arg | Pro | Pro | Pro | Arg | Ser | Glu | Ser | Phe |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Asp | Lys | Ser | Arg | Glu | Ser | Leu | Glu | Glu | Ala | Ala | Lys | Arg | Gln |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Gly | Gly | Leu | Phe | Lys | Gly | Pro | Pro | Tyr | Pro | Gly | Tyr | Pro | Phe |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Met | Ile | Pro | Asp | Leu | Thr | Ser | Pro | Tyr | Leu | Pro | Asn | Gly | Ser |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Pro | Thr | Ala | Arg | Thr | Tyr | Leu | Gln | Met | Lys | Trp | Pro | Leu |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Val | Gln | Ala | Gly | Ser | Leu | Gln | Ser | Arg | Gln | Ala | Leu | Lys |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ala | Arg | Ser | Pro | Ser | Pro | Ala | His | Ile | Val | Ser | Asn | Lys | Val |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Val | Val | Gln | His | Pro | His | His | Val | His | Pro | Leu | Thr | Pro | Leu |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Thr | Tyr | Ser | Asn | Glu | His | Phe | Thr | Pro | Gly | Asn | Pro | Pro | Pro |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Leu | Pro | Ala | Asp | Val | Asp | Pro | Lys | Thr | Gly | Ile | Pro | Arg | Pro |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | His | Pro | Pro | Asp | Ile | Ser | Pro | Tyr | Tyr | Pro | Leu | Ser | Pro | Gly |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Val | Gly | Gln | Ile | Pro | His | Pro | Leu | Gly | Trp | Leu | Val | Pro | Gln |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Gly | Gln | Pro | Val | Tyr | Pro | Ile | Thr | Thr | Gly | Gly | Phe | Arg | His |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Tyr | Pro | Thr | Ala | Leu | Thr | Val | Asn | Ala | Ser | Val | Ser | Arg | Phe |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Pro | His | Met | Val | Pro | Pro | His | His | Thr | Leu | His | Thr | Thr | Gly | 275 | 280 | 285 |
| Ile | Pro | His | Pro | Ala | Ile | Val | Thr | Pro | Thr | Val | Lys | Gln | Glu | Ser | 290 | 295 | 300 |
| Ser | Gln | Ser | Asp | Val | Gly | Ser | Leu | His | Ser | Ser | Lys | His | Gln | Asp | 305 | 310 | 315 |
| Ser | Lys | Lys | Glu | Glu | Glu | Lys | Lys | Lys | Pro | His | Ile | Lys | Lys | Pro | 320 | 325 | 330 |
| Leu | Asn | Ala | Phe | Met | Leu | Tyr | Met | Lys | Glu | Met | Arg | Ala | Lys | Val | 335 | 340 | 345 |
| Val | Ala | Glu | Cys | Thr | Leu | Lys | Glu | Ser | Ala | Ala | Ile | Asn | Gln | Ile | 350 | 355 | 360 |
| Leu | Gly | Arg | Arg | Trp | His | Ala | Leu | Ser | Arg | Glu | Glu | Gln | Ala | Lys | 365 | 370 | 375 |
| Tyr | Tyr | Glu | Leu | Ala | Arg | Lys | Glu | Arg | Gln | Leu | His | Met | Gln | Leu | 380 | 385 | 390 |
| Tyr | Pro | Gly | Trp | Ser | Ala | Arg | Asp | Asn | Tyr | Gly | Lys | Lys | Lys | Lys | 395 | 400 | 405 |
| Arg | Lys | Arg | Asp | Lys | Gln | Pro | Gly | Glu | Thr | Asn | Glu | His | Ser | Glu | 410 | 415 | 420 |
| Cys | Phe | Leu | Asn | Pro | Cys | Leu | Ser | Leu | Pro | Pro | Ile | Thr | Asp | Leu | 425 | 430 | 435 |
| Ser | Ala | Pro | Lys | Lys | Cys | Arg | Ala | Arg | Phe | Gly | Leu | Asp | Gln | Gln | 440 | 445 | 450 |
| Asn | Asn | Trp | Cys | Gly | Pro | Cys | Arg | Arg | Lys | Lys | Lys | Cys | Val | Arg | 455 | 460 | 465 |
| Tyr | Ile | Gln | Gly | Glu | Gly | Ser | Cys | Leu | Ser | Pro | Pro | Ser | Ser | Asp | 470 | 475 | 480 |
| Gly | Ser | Leu | Leu | Asp | Ser | Pro | Pro | Pro | Ser | Pro | Asn | Leu | Leu | Gly | 485 | 490 | 495 |
| Ser | Pro | Pro | Arg | Asp | Ala | Lys | Ser | Gln | Thr | Glu | Gln | Thr | Gln | Pro | 500 | 505 | 510 |
| Leu | Ser | Leu | Ser | Leu | Lys | Pro | Asp | Pro | Leu | Ala | His | Leu | Ser | Met | 515 | 520 | 525 |
| Met | Pro | Pro | Pro | Pro | Ala | Leu | Leu | Leu | Ala | Glu | Ala | Thr | His | Lys | 530 | 535 | 540 |
| Ala | Ser | Ala | Leu | Cys | Pro | Asn | Gly | Ala | Leu | Asp | Leu | Pro | Pro | Ala | 545 | 550 | 555 |
| Ala | Leu | Gln | Pro | Ala | Ala | Pro | Ser | Ser | Ser | Ile | Ala | Gln | Pro | Ser | 560 | 565 | 570 |

Thr Ser Trp Leu His Ser His Ser Ser Leu Ala Gly Thr Gln Pro  
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Gln Pro Leu Ser Leu Val Thr Lys Ser Leu Glu  
590 595

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<210> 46  
 <211> 832  
 <212> PRT  
 <213> Homo sapien

<400> 46  
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 20 25 30  
 Leu Lys Pro Met Thr Phe Ser Ile Tyr Glu Gly Gln Glu Pro Ser  
 35 40 45  
 Gln Ile Ile Phe Gln Phe Lys Ala Asn Pro Pro Ala Val Thr Phe  
 50 55 60  
 Glu Leu Thr Gly Glu Thr Asp Asn Ile Phe Val Ile Glu Arg Glu  
 65 70 75  
 Gly Leu Leu Tyr Tyr Asn Arg Ala Leu Asp Arg Glu Thr Arg Ser  
 80 85 90

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Thr | His | Asn | Leu | Gln | Val | Ala | Ala | Leu | Asp | Ala | Asn | Gly | Ile | Ile |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Val | Glu | Gly | Pro | Val | Pro | Ile | Thr | Ile | Glu | Val | Lys | Asp | Ile | Asn |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Asp | Asn | Arg | Pro | Thr | Phe | Leu | Gln | Ser | Lys | Tyr | Glu | Gly | Ser | Val |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Arg | Gln | Asn | Ser | Arg | Pro | Gly | Lys | Pro | Phe | Leu | Tyr | Val | Asn | Ala |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Thr | Asp | Leu | Asp | Asp | Pro | Ala | Thr | Pro | Asn | Gly | Gln | Leu | Tyr | Tyr |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Gln | Ile | Val | Ile | Gln | Leu | Pro | Met | Ile | Asn | Asn | Val | Met | Tyr | Phe |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Gln | Ile | Asn | Asn | Lys | Thr | Gly | Ala | Ile | Ser | Leu | Thr | Arg | Glu | Gly |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Ser | Gln | Glu | Leu | Asn | Pro | Ala | Lys | Asn | Pro | Ser | Tyr | Asn | Leu | Val |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Ile | Ser | Val | Lys | Asp | Met | Gly | Gly | Gln | Ser | Glu | Asn | Ser | Phe | Ser |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Asp | Thr | Thr | Ser | Val | Asp | Ile | Ile | Val | Thr | Glu | Asn | Ile | Trp | Lys |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ala | Pro | Lys | Pro | Val | Glu | Met | Val | Glu | Asn | Ser | Thr | Asp | Pro | His |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Pro | Ile | Lys | Ile | Thr | Gln | Val | Arg | Trp | Asn | Asp | Pro | Gly | Ala | Gln |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Tyr | Ser | Leu | Val | Asp | Lys | Glu | Lys | Leu | Pro | Arg | Phe | Pro | Phe | Ser |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Ile | Asp | Gln | Glu | Gly | Asp | Ile | Tyr | Val | Thr | Gln | Pro | Leu | Asp | Arg |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Glu | Glu | Lys | Asp | Ala | Tyr | Val | Phe | Tyr | Ala | Val | Ala | Lys | Asp | Glu |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Tyr | Gly | Lys | Pro | Leu | Ser | Tyr | Pro | Leu | Glu | Ile | His | Val | Lys | Val |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Lys | Asp | Ile | Asn | Asp | Asn | Pro | Pro | Thr | Cys | Pro | Ser | Pro | Val | Thr |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Val | Phe | Glu | Val | Gln | Glu | Asn | Glu | Arg | Leu | Gly | Asn | Ser | Ile | Gly |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Thr | Leu | Thr | Ala | His | Asp | Arg | Asp | Glu | Glu | Asn | Thr | Ala | Asn | Ser |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Phe | Leu | Asn | Tyr | Arg | Ile | Val | Glu | Gln | Thr | Pro | Lys | Leu | Pro | Met |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |

|                 |                     |                         |     |     |     |
|-----------------|---------------------|-------------------------|-----|-----|-----|
| Asp Gly Leu Phe | Leu Ile Gln Thr Tyr | Ala Gly Met Leu Gln Leu | 395 | 400 | 405 |
| Ala Lys Gln Ser | Leu Lys Lys Gln Asp | Thr Pro Gln Tyr Asn Leu | 410 | 415 | 420 |
| Thr Ile Glu Val | Ser Asp Lys Asp Phe | Lys Thr Leu Cys Phe Val | 425 | 430 | 435 |
| Gln Ile Asn Val | Ile Asp Ile Asn Asp | Gln Ile Pro Ile Phe Glu | 440 | 445 | 450 |
| Lys Ser Asp Tyr | Gly Asn Leu Thr Leu | Ala Glu Asp Thr Asn Ile | 455 | 460 | 465 |
| Gly Ser Thr Ile | Leu Thr Ile Gln Ala | Thr Asp Ala Asp Glu Pro | 470 | 475 | 480 |
| Phe Thr Gly Ser | Ser Lys Ile Leu Tyr | His Ile Ile Lys Gly Asp | 485 | 490 | 495 |
| Ser Glu Gly Arg | Leu Gly Val Asp Thr | Asp Pro His Thr Asn Thr | 500 | 505 | 510 |
| Gly Tyr Val Ile | Ile Lys Lys Pro Leu | Asp Phe Glu Thr Ala Ala | 515 | 520 | 525 |
| Val Ser Asn Ile | Val Phe Lys Ala Glu | Asn Pro Glu Pro Leu Val | 530 | 535 | 540 |
| Phe Gly Val Lys | Tyr Asn Ala Ser Ser | Phe Ala Lys Phe Thr Leu | 545 | 550 | 555 |
| Ile Val Thr Asp | Val Asn Glu Ala Pro | Gln Phe Ser Gln His Val | 560 | 565 | 570 |
| Phe Gln Ala Lys | Val Ser Glu Asp Val | Ala Ile Gly Thr Lys Val | 575 | 580 | 585 |
| Gly Asn Val Thr | Ala Lys Asp Pro Glu | Gly Leu Asp Ile Ser Tyr | 590 | 595 | 600 |
| Ser Leu Arg Gly | Asp Thr Arg Gly Trp | Leu Lys Ile Asp His Val | 605 | 610 | 615 |
| Thr Gly Glu Ile | Phe Ser Val Ala Pro | Leu Asp Arg Glu Ala Gly | 620 | 625 | 630 |
| Ser Pro Tyr Arg | Val Gln Val Val Ala | Thr Glu Val Gly Gly Ser | 635 | 640 | 645 |
| Ser Leu Ser Ser | Val Ser Glu Phe His | Leu Ile Leu Met Asp Val | 650 | 655 | 660 |
| Asn Asp Asn Pro | Pro Arg Leu Ala Lys | Asp Tyr Thr Gly Leu Phe | 665 | 670 | 675 |
| Phe Cys His Pro | Leu Ser Ala Pro Gly | Ser Leu Ile Phe Glu Ala | 680 | 685 | 690 |
| Thr Asp Asp Asp | Gln His Leu Phe Arg | Gly Pro His Phe Thr Phe |     |     |     |

| 695 |     |     |     |     | 700 |     |     |     |     | 705 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Leu | Gly | Ser | Gly | Ser | Leu | Gln | Asn | Asp | Trp | Glu | Val | Ser | Lys |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Ile | Asn | Gly | Thr | His | Ala | Arg | Leu | Ser | Thr | Arg | His | Thr | Glu | Phe |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |
| Glu | Glu | Arg | Glu | Tyr | Val | Val | Leu | Ile | Arg | Ile | Asn | Asp | Gly | Gly |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |
| Arg | Pro | Pro | Leu | Glu | Gly | Ile | Val | Ser | Leu | Pro | Val | Thr | Phe | Cys |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |
| Ser | Cys | Val | Glu | Gly | Ser | Cys | Phe | Arg | Pro | Ala | Gly | His | Gln | Thr |
|     |     |     |     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |
| Gly | Ile | Pro | Thr | Val | Gly | Met | Ala | Val | Gly | Ile | Leu | Leu | Thr | Thr |
|     |     |     |     | 785 |     |     |     |     | 790 |     |     |     |     | 795 |
| Leu | Leu | Val | Ile | Gly | Ile | Ile | Leu | Ala | Val | Val | Phe | Ile | Arg | Ile |
|     |     |     |     | 800 |     |     |     |     | 805 |     |     |     |     | 810 |
| Lys | Lys | Asp | Lys | Gly | Lys | Asp | Asn | Val | Glu | Ser | Ala | Gln | Ala | Ser |
|     |     |     |     | 815 |     |     |     |     | 820 |     |     |     |     | 825 |
| Glu | Val | Lys | Pro | Leu | Arg | Ser |     |     |     |     |     |     |     |     |
|     |     |     |     | 830 |     |     |     |     |     |     |     |     |     |     |

<210> 47  
 <211> 1258  
 <212> DNA  
 <213> Homo sapien

<400> 47  
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 ggaagcagag agaccacag agcaggaggg aggcagaaag tggagacgga 100  
 cctgagcccg aggaagaggc aggcagaggc tgaggctgat tccacccag 150  
 cctgcctgga caaccctcct tagccgcagc cccttccagt tccctagggg 200  
 ttctgcccct cccctctct ggggcaccag cccccaggg tcttgcattc 250  
 caccatgtcg atggctgtgg aaacctttgg cttcttcatg gcaactgtgg 300  
 ggctgctgat gctgggggtg actctgccaa acagctactg gcgagtgtcc 350  
 actgtgcacg ggaacgtcat caccaccaac accatcttcg agaacctctg 400  
 gtttagctgt gccaccgact ccctgggcgt ctacaactgc tgggagttcc 450  
 cgtccatgct ggccctctct gggtatattc aggcctgccg ggcaactcatg 500  
 atcaccgcca tctcctgagg ctctctcggc ctcttgctag gcatagcggg 550  
 cctgcgctgc accaacattg ggggcctgga gctctccagg aaagccaagc 600  
 tggcggccac cgcagggggc ctccacattc tggccggtat ctgcgggatg 650



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 gaccgttc 1258

<210> 48  
 <211> 1258  
 <212> PRT  
 <213> Homo sapien

<400> 48  
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 35 40 45  
 Thr Gly Cys Cys Ala Gly Gly Ala Ala Gly Cys Ala Gly Ala Gly  
 50 55 60  
 Ala Gly Ala Cys Cys Cys Ala Cys Ala Gly Ala Gly Cys Ala Gly  
 65 70 75  
 Gly Ala Gly Gly Gly Ala Gly Gly Cys Ala Gly Ala Ala Ala Gly  
 80 85 90  
 Thr Gly Gly Ala Gly Ala Cys Gly Gly Ala Cys Cys Thr Gly Ala  
 95 100 105  
 Gly Cys Cys Cys Gly Ala Gly Gly Ala Ala Gly Ala Gly Gly Cys  
 110 115 120  
 Ala Gly Gly Cys Ala Gly Ala Gly Gly Cys Thr Gly Ala Gly Gly  
 125 130 135  
 Cys Thr Gly Ala Thr Thr Cys Cys Ala Cys Cys Cys Cys Ala Gly  
 140 145 150

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Cys | Cys | Thr | Gly | Cys | Cys | Thr | Gly | Gly | Ala | Cys | Ala | Ala | Cys | Cys |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Cys | Thr | Cys | Cys | Thr | Thr | Ala | Gly | Cys | Cys | Gly | Cys | Ala | Gly | Cys |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Cys | Cys | Cys | Thr | Thr | Cys | Cys | Ala | Gly | Thr | Thr | Cys | Cys | Cys | Thr |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Ala | Gly | Gly | Gly | Gly | Thr | Thr | Cys | Thr | Gly | Cys | Cys | Cys | Cys | Thr |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Cys | Cys | Cys | Cys | Cys | Thr | Cys | Thr | Cys | Thr | Gly | Gly | Gly | Gly | Cys |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Ala | Cys | Cys | Ala | Gly | Cys | Cys | Cys | Cys | Cys | Cys | Ala | Gly | Gly | Gly |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Thr | Cys | Cys | Thr | Gly | Cys | Ala | Thr | Cys | Cys | Cys | Ala | Cys | Cys | Ala |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Thr | Gly | Thr | Cys | Gly | Ala | Thr | Gly | Gly | Cys | Thr | Gly | Thr | Gly | Gly |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Ala | Ala | Ala | Cys | Cys | Thr | Thr | Thr | Gly | Gly | Cys | Thr | Thr | Cys | Thr |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Thr | Cys | Ala | Thr | Gly | Gly | Cys | Ala | Ala | Cys | Thr | Gly | Thr | Gly | Gly |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Gly | Gly | Cys | Thr | Gly | Cys | Thr | Gly | Ala | Thr | Gly | Cys | Thr | Gly | Gly |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Gly | Gly | Gly | Thr | Gly | Ala | Cys | Thr | Cys | Thr | Gly | Cys | Cys | Ala | Ala |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Ala | Cys | Ala | Gly | Cys | Thr | Ala | Cys | Thr | Gly | Gly | Cys | Gly | Ala | Gly |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Thr | Gly | Thr | Cys | Cys | Ala | Cys | Thr | Gly | Thr | Gly | Cys | Ala | Cys | Gly |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Gly | Gly | Ala | Ala | Cys | Gly | Thr | Cys | Ala | Thr | Cys | Ala | Cys | Cys | Ala |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Cys | Cys | Ala | Ala | Cys | Ala | Cys | Cys | Ala | Thr | Cys | Thr | Thr | Cys | Gly |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Ala | Gly | Ala | Ala | Cys | Cys | Thr | Cys | Thr | Gly | Gly | Thr | Thr | Thr | Ala |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Gly | Cys | Thr | Gly | Thr | Gly | Cys | Cys | Ala | Cys | Cys | Gly | Ala | Cys | Thr |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |
| Cys | Cys | Cys | Thr | Gly | Gly | Gly | Cys | Gly | Thr | Cys | Thr | Ala | Cys | Ala |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |
| Ala | Cys | Thr | Gly | Cys | Thr | Gly | Gly | Gly | Ala | Gly | Thr | Thr | Cys | Cys |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |

|                 |                     |                         |     |     |     |
|-----------------|---------------------|-------------------------|-----|-----|-----|
| Cys Gly Thr Cys | Cys Ala Thr Gly Cys | Thr Gly Gly Cys Cys Cys | 455 | 460 | 465 |
| Thr Cys Thr Cys | Thr Gly Gly Gly Thr | Ala Thr Ala Thr Thr Cys | 470 | 475 | 480 |
| Ala Gly Gly Cys | Cys Thr Gly Cys Cys | Gly Gly Gly Cys Ala Cys | 485 | 490 | 495 |
| Thr Cys Ala Thr | Gly Ala Thr Cys Ala | Cys Cys Gly Cys Cys Ala | 500 | 505 | 510 |
| Thr Cys Cys Thr | Cys Cys Thr Gly Gly | Gly Cys Thr Thr Cys Cys | 515 | 520 | 525 |
| Thr Cys Gly Gly | Cys Cys Thr Cys Thr | Thr Gly Cys Thr Ala Gly | 530 | 535 | 540 |
| Gly Cys Ala Thr | Ala Gly Cys Gly Gly | Gly Cys Cys Thr Gly Cys | 545 | 550 | 555 |
| Gly Cys Thr Gly | Cys Ala Cys Cys Ala | Ala Cys Ala Thr Thr Gly | 560 | 565 | 570 |
| Gly Gly Gly Gly | Cys Cys Thr Gly Gly | Ala Gly Cys Thr Cys Thr | 575 | 580 | 585 |
| Cys Cys Ala Gly | Gly Ala Ala Ala Gly | Cys Cys Ala Ala Gly Cys | 590 | 595 | 600 |
| Thr Gly Gly Cys | Gly Gly Cys Cys Ala | Cys Cys Gly Cys Ala Gly | 605 | 610 | 615 |
| Gly Gly Gly Cys | Cys Cys Thr Cys Cys | Ala Cys Ala Thr Thr Cys | 620 | 625 | 630 |
| Thr Gly Gly Cys | Cys Gly Gly Thr Ala | Thr Cys Thr Gly Cys Gly | 635 | 640 | 645 |
| Gly Gly Ala Thr | Gly Gly Thr Gly Gly | Cys Cys Ala Thr Cys Thr | 650 | 655 | 660 |
| Cys Cys Thr Gly | Gly Thr Ala Cys Gly | Cys Cys Thr Thr Cys Ala | 665 | 670 | 675 |
| Ala Cys Ala Thr | Cys Ala Cys Cys Cys | Gly Gly Gly Ala Cys Thr | 680 | 685 | 690 |
| Thr Cys Thr Thr | Cys Gly Ala Cys Cys | Cys Cys Thr Thr Gly Thr | 695 | 700 | 705 |
| Ala Cys Cys Cys | Cys Gly Gly Ala Ala | Cys Cys Ala Ala Gly Thr | 710 | 715 | 720 |
| Ala Cys Gly Ala | Gly Cys Thr Gly Gly | Gly Cys Cys Cys Cys Gly | 725 | 730 | 735 |
| Cys Cys Cys Thr | Cys Thr Ala Cys Cys | Thr Gly Gly Gly Gly Thr | 740 | 745 | 750 |
| Gly Gly Ala Gly | Cys Gly Cys Cys Thr | Cys Ala Cys Thr Gly Ala |     |     |     |

| 755 |     |     |     |      | 760 |     |     |     |     | 765  |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|------|-----|-----|-----|------|
| Thr | Cys | Thr | Cys | Cys  | Ala | Thr | Cys | Cys | Thr | Gly  | Gly | Gly | Thr | Gly  |
|     |     |     |     | 770  |     |     |     |     |     | 775  |     |     |     | 780  |
| Gly | Cys | Cys | Thr | Cys  | Thr | Gly | Cys | Cys | Thr | Cys  | Thr | Gly | Cys | Thr  |
|     |     |     |     | 785  |     |     |     |     |     | 790  |     |     |     | 795  |
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|     |     |     |     | 830  |     |     |     |     |     | 835  |     |     |     | 840  |
| Gly | Gly | Cys | Gly | Gly  | Cys | Cys | Cys | Thr | Ala | Cys  | Cys | Ala | Gly | Gly  |
|     |     |     |     | 845  |     |     |     |     |     | 850  |     |     |     | 855  |
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|     |     |     |     | 875  |     |     |     |     |     | 880  |     |     |     | 885  |
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|     |     |     |     | 905  |     |     |     |     |     | 910  |     |     |     | 915  |
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| Thr | Cys | Thr | Gly | Gly  | Cys | Cys | Cys | Gly | Thr | Gly  | Gly | Gly | Cys | Cys  |
|     |     |     |     | 950  |     |     |     |     |     | 955  |     |     |     | 960  |
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| Cys Phe Phe Trp Arg | Phe Met Phe Tyr Gly | Ile Phe Leu Tyr Leu |     |  |     |
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| Gly Glu Val Thr Lys | Ala Val Gln Pro Leu | Leu Leu Gly Arg Ile |     |  |     |
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| Ile Ala Ser Tyr Asp | Pro Asp Asn Lys Glu | Glu Arg Ser Ile Ala |     |  |     |
|                     | 110                 |                     | 115 |  | 120 |
| Ile Tyr Leu Gly Ile | Gly Leu Cys Leu Leu | Phe Ile Val Arg Thr |     |  |     |
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| Leu Leu Leu His Pro | Ala Ile Phe Gly Leu | His His Ile Gly Met |     |  |     |
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| Gln Met Arg Ile Ala | Met Phe Ser Leu Ile | Tyr Lys Lys Thr Leu |     |  |     |
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| Leu Met Gly Leu Ile | Trp Glu Leu Leu Gln | Ala Ser Ala Phe Cys |     |  |     |
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| Gly Arg Met Met Met | Lys Tyr Arg Asp Gln | Arg Ala Gly Lys Ile |     |  |     |
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| Ser Val Lys Ala Tyr | Cys Trp Glu Glu Ala | Met Glu Lys Met Ile |     |  |     |
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| Glu Asn Leu Arg Gln | Thr Glu Leu Lys Leu | Thr Arg Lys Ala Ala |     |  |     |
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| Tyr Val Arg Tyr Phe | Asn Ser Ser Ala Phe | Phe Phe Ser Gly Phe |     |  |     |
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| Phe Val Val Phe Leu | Ser Val Leu Pro Tyr | Ala Leu Ile Lys Gly |     |  |     |
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| Ile Ile Leu Arg Lys | Ile Phe Thr Thr Ile | Ser Phe Cys Ile Val |     |  |     |
|                     | 335                 |                     | 340 |  | 345 |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Arg | Met | Ala | Val | Thr | Arg | Gln | Phe | Pro | Trp | Ala | Val | Gln | Thr | 350 | 355 | 360 |
| Trp | Tyr | Asp | Ser | Leu | Gly | Ala | Ile | Asn | Lys | Ile | Gln | Asp | Phe | Leu | 365 | 370 | 375 |
| Gln | Lys | Gln | Glu | Tyr | Lys | Thr | Leu | Glu | Tyr | Asn | Leu | Thr | Thr | Thr | 380 | 385 | 390 |
| Glu | Val | Val | Met | Glu | Asn | Val | Thr | Ala | Phe | Trp | Glu | Glu | Gly | Phe | 395 | 400 | 405 |
| Gly | Glu | Leu | Phe | Glu | Lys | Ala | Lys | Gln | Asn | Asn | Asn | Asn | Arg | Lys | 410 | 415 | 420 |
| Thr | Ser | Asn | Gly | Asp | Asp | Ser | Leu | Phe | Phe | Ser | Asn | Phe | Ser | Leu | 425 | 430 | 435 |
| Leu | Gly | Thr | Pro | Val | Leu | Lys | Asp | Ile | Asn | Phe | Lys | Ile | Glu | Arg | 440 | 445 | 450 |
| Gly | Gln | Leu | Leu | Ala | Val | Ala | Gly | Ser | Thr | Gly | Ala | Gly | Lys | Thr | 455 | 460 | 465 |
| Ser | Leu | Leu | Met | Met | Ile | Met | Gly | Glu | Leu | Glu | Pro | Ser | Glu | Gly | 470 | 475 | 480 |
| Lys | Ile | Lys | His | Ser | Gly | Arg | Ile | Ser | Phe | Cys | Ser | Gln | Phe | Ser | 485 | 490 | 495 |
| Trp | Ile | Met | Pro | Gly | Thr | Ile | Lys | Glu | Asn | Ile | Ile | Phe | Gly | Val | 500 | 505 | 510 |
| Ser | Tyr | Asp | Glu | Tyr | Arg | Tyr | Arg | Ser | Val | Ile | Lys | Ala | Cys | Gln | 515 | 520 | 525 |
| Leu | Glu | Glu | Asp | Ile | Ser | Lys | Phe | Ala | Glu | Lys | Asp | Asn | Ile | Val | 530 | 535 | 540 |
| Leu | Gly | Glu | Gly | Gly | Ile | Thr | Leu | Ser | Gly | Gly | Gln | Arg | Ala | Arg | 545 | 550 | 555 |
| Ile | Ser | Leu | Ala | Arg | Ala | Val | Tyr | Lys | Asp | Ala | Asp | Leu | Tyr | Leu | 560 | 565 | 570 |
| Leu | Asp | Ser | Pro | Phe | Gly | Tyr | Leu | Asp | Val | Leu | Thr | Glu | Lys | Glu | 575 | 580 | 585 |
| Ile | Phe | Glu | Ser | Cys | Val | Cys | Lys | Leu | Met | Ala | Asn | Lys | Thr | Arg | 590 | 595 | 600 |
| Ile | Leu | Val | Thr | Ser | Lys | Met | Glu | His | Leu | Lys | Lys | Ala | Asp | Lys | 605 | 610 | 615 |
| Ile | Leu | Ile | Leu | Asn | Glu | Gly | Ser | Ser | Tyr | Phe | Tyr | Gly | Thr | Phe | 620 | 625 | 630 |
| Ser | Glu | Leu | Gln | Asn | Leu | Gln | Pro | Asp | Phe | Ser | Ser | Lys | Leu | Met | 635 | 640 | 645 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Cys | Asp | Ser | Phe | Asp | Gln | Phe | Ser | Ala | Glu | Arg | Arg | Asn | Ser |  |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |  |
| Ile | Leu | Thr | Glu | Thr | Leu | His | Arg | Phe | Ser | Leu | Glu | Gly | Asp | Ala |  |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |  |
| Pro | Val | Ser | Trp | Thr | Glu | Thr | Lys | Lys | Gln | Ser | Phe | Lys | Gln | Thr |  |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |  |
| Gly | Glu | Phe | Gly | Glu | Lys | Arg | Lys | Asn | Ser | Ile | Leu | Asn | Pro | Ile |  |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |  |
| Asn | Ser | Ile | Arg | Lys | Phe | Ser | Ile | Val | Gln | Lys | Thr | Pro | Leu | Gln |  |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |  |
| Met | Asn | Gly | Ile | Glu | Glu | Asp | Ser | Asp | Glu | Pro | Leu | Glu | Arg | Arg |  |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |  |
| Leu | Ser | Leu | Val | Pro | Asp | Ser | Glu | Gln | Gly | Glu | Ala | Ile | Leu | Pro |  |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |  |
| Arg | Ile | Ser | Val | Ile | Ser | Thr | Gly | Pro | Thr | Leu | Gln | Ala | Arg | Arg |  |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |  |
| Arg | Gln | Ser | Val | Leu | Asn | Leu | Met | Thr | His | Ser | Val | Asn | Gln | Gly |  |
|     |     |     |     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |  |
| Gln | Asn | Ile | His | Arg | Lys | Thr | Thr | Ala | Ser | Thr | Arg | Lys | Val | Ser |  |
|     |     |     |     | 785 |     |     |     |     | 790 |     |     |     |     | 795 |  |
| Leu | Ala | Pro | Gln | Ala | Asn | Leu | Thr | Glu | Leu | Asp | Ile | Tyr | Ser | Arg |  |
|     |     |     |     | 800 |     |     |     |     | 805 |     |     |     |     | 810 |  |
| Arg | Leu | Ser | Gln | Glu | Thr | Gly | Leu | Glu | Ile | Ser | Glu | Glu | Ile | Asn |  |
|     |     |     |     | 815 |     |     |     |     | 820 |     |     |     |     | 825 |  |
| Glu | Glu | Asp | Leu | Lys | Glu | Cys | Leu | Phe | Asp | Asp | Met | Glu | Ser | Ile |  |
|     |     |     |     | 830 |     |     |     |     | 835 |     |     |     |     | 840 |  |
| Pro | Ala | Val | Thr | Thr | Trp | Asn | Thr | Tyr | Leu | Arg | Tyr | Ile | Thr | Val |  |
|     |     |     |     | 845 |     |     |     |     | 850 |     |     |     |     | 855 |  |
| His | Lys | Ser | Leu | Ile | Phe | Val | Leu | Ile | Trp | Cys | Leu | Val | Ile | Phe |  |
|     |     |     |     | 860 |     |     |     |     | 865 |     |     |     |     | 870 |  |
| Leu | Ala | Glu | Val | Ala | Ala | Ser | Leu | Val | Val | Leu | Trp | Leu | Leu | Gly |  |
|     |     |     |     | 875 |     |     |     |     | 880 |     |     |     |     | 885 |  |
| Asn | Thr | Pro | Leu | Gln | Asp | Lys | Gly | Asn | Ser | Thr | His | Ser | Arg | Asn |  |
|     |     |     |     | 890 |     |     |     |     | 895 |     |     |     |     | 900 |  |
| Asn | Ser | Tyr | Ala | Val | Ile | Ile | Thr | Ser | Thr | Ser | Ser | Tyr | Tyr | Val |  |
|     |     |     |     | 905 |     |     |     |     | 910 |     |     |     |     | 915 |  |
| Phe | Tyr | Ile | Tyr | Val | Gly | Val | Ala | Asp | Thr | Leu | Leu | Ala | Met | Gly |  |
|     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |     | 930 |  |
| Phe | Phe | Arg | Gly | Leu | Pro | Leu | Val | His | Thr | Leu | Ile | Thr | Val | Ser |  |
|     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     | 945 |  |
| Lys | Ile | Leu | His | His | Lys | Met | Leu | His | Ser | Val | Leu | Gln | Ala | Pro |  |

| 950 |     |     |     |      | 955 |     |     |     |      | 960 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Met | Ser | Thr | Leu | Asn  | Thr | Leu | Lys | Ala | Gly  | Gly | Ile | Leu | Asn | Arg  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Phe | Ser | Lys | Asp | Ile  | Ala | Ile | Leu | Asp | Asp  | Leu | Leu | Pro | Leu | Thr  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Ile | Phe | Asp | Phe | Ile  | Gln | Leu | Leu | Leu | Ile  | Val | Ile | Gly | Ala | Ile  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Ala | Val | Val | Ala | Val  | Leu | Gln | Pro | Tyr | Ile  | Phe | Val | Ala | Thr | Val  |
|     |     |     |     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |
| Pro | Val | Ile | Val | Ala  | Phe | Ile | Met | Leu | Arg  | Ala | Tyr | Phe | Leu | Gln  |
|     |     |     |     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |
| Thr | Ser | Gln | Gln | Leu  | Lys | Gln | Leu | Glu | Ser  | Glu | Gly | Arg | Ser | Pro  |
|     |     |     |     | 1040 |     |     |     |     | 1045 |     |     |     |     | 1050 |
| Ile | Phe | Thr | His | Leu  | Val | Thr | Ser | Leu | Lys  | Gly | Leu | Trp | Thr | Leu  |
|     |     |     |     | 1055 |     |     |     |     | 1060 |     |     |     |     | 1065 |
| Arg | Ala | Phe | Gly | Arg  | Gln | Pro | Tyr | Phe | Glu  | Thr | Leu | Phe | His | Lys  |
|     |     |     |     | 1070 |     |     |     |     | 1075 |     |     |     |     | 1080 |
| Ala | Leu | Asn | Leu | His  | Thr | Ala | Asn | Trp | Phe  | Leu | Tyr | Leu | Ser | Thr  |
|     |     |     |     | 1085 |     |     |     |     | 1090 |     |     |     |     | 1095 |
| Leu | Arg | Trp | Phe | Gln  | Met | Arg | Ile | Glu | Met  | Ile | Phe | Val | Ile | Phe  |
|     |     |     |     | 1100 |     |     |     |     | 1105 |     |     |     |     | 1110 |
| Phe | Ile | Ala | Val | Thr  | Phe | Ile | Ser | Ile | Leu  | Thr | Thr | Gly | Glu | Gly  |
|     |     |     |     | 1115 |     |     |     |     | 1120 |     |     |     |     | 1125 |
| Glu | Gly | Arg | Val | Gly  | Ile | Ile | Leu | Thr | Leu  | Ala | Met | Asn | Ile | Met  |
|     |     |     |     | 1130 |     |     |     |     | 1135 |     |     |     |     | 1140 |
| Ser | Thr | Leu | Gln | Trp  | Ala | Val | Asn | Ser | Ser  | Ile | Asp | Val | Asp | Ser  |
|     |     |     |     | 1145 |     |     |     |     | 1150 |     |     |     |     | 1155 |
| Leu | Met | Arg | Ser | Val  | Ser | Arg | Val | Phe | Lys  | Phe | Ile | Asp | Met | Pro  |
|     |     |     |     | 1160 |     |     |     |     | 1165 |     |     |     |     | 1170 |
| Thr | Glu | Gly | Lys | Pro  | Thr | Lys | Ser | Thr | Lys  | Pro | Tyr | Lys | Asn | Gly  |
|     |     |     |     | 1175 |     |     |     |     | 1180 |     |     |     |     | 1185 |
| Gln | Leu | Ser | Lys | Val  | Met | Ile | Ile | Glu | Asn  | Ser | His | Val | Lys | Lys  |
|     |     |     |     | 1190 |     |     |     |     | 1195 |     |     |     |     | 1200 |
| Asp | Asp | Ile | Trp | Pro  | Ser | Gly | Gly | Gln | Met  | Thr | Val | Lys | Asp | Leu  |
|     |     |     |     | 1205 |     |     |     |     | 1210 |     |     |     |     | 1215 |
| Thr | Ala | Lys | Tyr | Thr  | Glu | Gly | Gly | Asn | Ala  | Ile | Leu | Glu | Asn | Ile  |
|     |     |     |     | 1220 |     |     |     |     | 1225 |     |     |     |     | 1230 |
| Ser | Phe | Ser | Ile | Ser  | Pro | Gly | Gln | Arg | Val  | Gly | Leu | Leu | Gly | Arg  |
|     |     |     |     | 1235 |     |     |     |     | 1240 |     |     |     |     | 1245 |
| Thr | Gly | Ser | Gly | Lys  | Ser | Thr | Leu | Leu | Ser  | Ala | Phe | Leu | Arg | Leu  |
|     |     |     |     | 1250 |     |     |     |     | 1255 |     |     |     |     | 1260 |

Leu Asn Thr Glu Gly Glu Ile Gln Ile Asp Gly Val Ser Trp Asp  
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 1280 1285 1290  
 Gln Lys Val Phe Ile Phe Ser Gly Thr Phe Arg Lys Asn Leu Asp  
 1295 1300 1305  
 Pro Tyr Glu Gln Trp Ser Asp Gln Glu Ile Trp Lys Val Ala Asp  
 1310 1315 1320  
 Glu Val Gly Leu Arg Ser Val Ile Glu Gln Phe Pro Gly Lys Leu  
 1325 1330 1335  
 Asp Phe Val Leu Val Asp Gly Gly Cys Val Leu Ser His Gly His  
 1340 1345 1350  
 Lys Gln Leu Met Cys Leu Ala Arg Ser Val Leu Ser Lys Ala Lys  
 1355 1360 1365  
 Ile Leu Leu Leu Asp Glu Pro Ser Ala His Leu Asp Pro Val Thr  
 1370 1375 1380  
 Tyr Gln Ile Ile Arg Arg Thr Leu Lys Gln Ala Phe Ala Asp Cys  
 1385 1390 1395  
 Thr Val Ile Leu Cys Glu His Arg Ile Glu Ala Met Leu Glu Cys  
 1400 1405 1410  
 Gln Gln Phe Leu Val Ile Glu Glu Asn Lys Val Arg Gln Tyr Asp  
 1415 1420 1425  
 Ser Ile Gln Lys Leu Leu Asn Glu Arg Ser Leu Phe Arg Gln Ala  
 1430 1435 1440  
 Ile Ser Pro Ser Asp Arg Val Lys Leu Phe Pro His Arg Asn Ser  
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 1460 1465 1470  
 Thr Glu Glu Glu Val Gln Asp Thr Arg Leu  
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<211> 1847

<212> DNA

<213> Homo sapien

<400> 51

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cattaaaatt ctgagaggac ttggcaaggg ccgcacagct ggggcat 1847

<210> 52

<211> 359

<212> PRT

<213> Homo sapien

<400> 52

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Pro | Asn | Gly | Thr | Ala | Ser | Ser | Phe | Cys | Leu | Asp | Ser | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Cys | Lys | Ile | Thr | Ile | Thr | Val | Val | Leu | Ala | Val | Leu | Ile | Leu |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Thr | Val | Ala | Gly | Asn | Val | Val | Val | Cys | Leu | Ala | Val | Gly | Leu |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Arg | Arg | Leu | Arg | Asn | Leu | Thr | Asn | Cys | Phe | Ile | Val | Ser | Leu |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ile | Thr | Asp | Leu | Leu | Leu | Gly | Leu | Leu | Val | Leu | Pro | Phe | Ser |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ile | Tyr | Gln | Leu | Ser | Cys | Lys | Trp | Ser | Phe | Gly | Lys | Val | Phe |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Asn | Ile | Tyr | Thr | Ser | Leu | Asp | Val | Met | Leu | Cys | Thr | Ala | Ser |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Leu | Asn | Leu | Phe | Met | Ile | Ser | Leu | Asp | Arg | Tyr | Cys | Ala | Val |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Asp | Pro | Leu | Arg | Tyr | Pro | Val | Leu | Val | Thr | Pro | Val | Arg | Val |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ile | Ser | Leu | Val | Leu | Ile | Trp | Val | Ile | Ser | Ile | Thr | Leu | Ser |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Leu | Ser | Ile | His | Leu | Gly | Trp | Asn | Ser | Arg | Asn | Glu | Thr | Ser |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Gly | Asn | His | Thr | Thr | Ser | Lys | Cys | Lys | Val | Gln | Val | Asn | Glu |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Tyr | Gly | Leu | Val | Asp | Gly | Leu | Val | Thr | Phe | Tyr | Leu | Pro | Leu |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ile | Met | Cys | Ile | Thr | Tyr | Tyr | Arg | Ile | Phe | Lys | Val | Ala | Arg |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Gln | Ala | Lys | Arg | Ile | Asn | His | Ile | Ser | Ser | Trp | Lys | Ala | Ala |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ile | Arg | Glu | His | Lys | Ala | Thr | Val | Thr | Leu | Ala | Ala | Val | Met |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Phe | Ile | Ile | Cys | Trp | Phe | Pro | Tyr | Phe | Thr | Ala | Phe | Val |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Arg | Gly | Leu | Arg | Gly | Asp | Asp | Ala | Ile | Asn | Glu | Val | Leu | Glu | 260 | 265 | 270 |
| Ala | Ile | Val | Leu | Trp | Leu | Gly | Tyr | Ala | Asn | Ser | Ala | Leu | Asn | Pro | 275 | 280 | 285 |
| Ile | Leu | Tyr | Ala | Ala | Leu | Asn | Arg | Asp | Phe | Arg | Thr | Gly | Tyr | Gln | 290 | 295 | 300 |
| Gln | Leu | Phe | Cys | Cys | Arg | Leu | Ala | Asn | Arg | Asn | Ser | His | Lys | Thr | 305 | 310 | 315 |
| Ser | Leu | Arg | Ser | Asn | Ala | Ser | Gln | Leu | Ser | Arg | Thr | Gln | Ser | Arg | 320 | 325 | 330 |
| Glu | Pro | Arg | Gln | Gln | Glu | Glu | Lys | Pro | Leu | Lys | Leu | Gln | Val | Trp | 335 | 340 | 345 |
| Ser | Gly | Thr | Glu | Val | Thr | Ala | Pro | Gln | Gly | Ala | Thr | Asp | Arg |     | 350 | 355 |     |

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 <212> DNA  
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<400> 53  
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 ttgggaattt ggaaattacc tatgtgcaga ggaattatga tctttccttc 400  
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<212> PRT

<213> Homo sapien

<400> 54

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Arg | Pro | Ser | Gly | Thr | Ala | Gly | Ala | Ala | Leu | Leu | Ala | Leu | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ala | Leu | Cys | Pro | Ala | Ser | Arg | Ala | Leu | Glu | Glu | Lys | Lys | Val |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Gln | Gly | Thr | Ser | Asn | Lys | Leu | Thr | Gln | Leu | Gly | Thr | Phe | Glu |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | His | Phe | Leu | Ser | Leu | Gln | Arg | Met | Phe | Asn | Asn | Cys | Glu | Val |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Gly | Asn | Leu | Glu | Ile | Thr | Tyr | Val | Gln | Arg | Asn | Tyr | Asp |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Phe | Leu | Lys | Thr | Ile | Gln | Glu | Val | Ala | Gly | Tyr | Val | Leu |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Ala | Leu | Asn | Thr | Val | Glu | Arg | Ile | Pro | Leu | Glu | Asn | Leu | Gln |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Ile | Arg | Gly | Asn | Met | Tyr | Tyr | Glu | Asn | Ser | Tyr | Ala | Leu | Ala |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Leu | Ser | Asn | Tyr | Asp | Ala | Asn | Lys | Thr | Gly | Leu | Lys | Glu | Leu |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Met | Arg | Asn | Leu | Gln | Glu | Ile | Leu | His | Gly | Ala | Val | Arg | Phe |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Asn | Asn | Pro | Ala | Leu | Cys | Asn | Val | Glu | Ser | Ile | Gln | Trp | Arg |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Ile | Val | Ser | Ser | Asp | Phe | Leu | Ser | Asn | Met | Ser | Met | Asp | Phe |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Asn | His | Leu | Gly | Ser | Cys | Gln | Lys | Cys | Asp | Pro | Ser | Cys | Pro |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Gly | Ser | Cys | Trp | Gly | Ala | Gly | Glu | Glu | Asn | Cys | Gln | Lys | Leu |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Lys | Ile | Ile | Cys | Ala | Gln | Gln | Cys | Ser | Gly | Arg | Cys | Arg | Gly |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Ser | Pro | Ser | Asp | Cys | Cys | His | Asn | Gln | Cys | Ala | Ala | Gly | Cys |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Gly | Pro | Arg | Glu | Ser | Asp | Cys | Leu | Val | Cys | Arg | Lys | Phe | Arg |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Glu | Ala | Thr | Cys | Lys | Asp | Thr | Cys | Pro | Pro | Leu | Met | Leu | Tyr | 260 | 265 | 270 |
| Asn | Pro | Thr | Thr | Tyr | Gln | Met | Asp | Val | Asn | Pro | Glu | Gly | Lys | Tyr | 275 | 280 | 285 |
| Ser | Phe | Gly | Ala | Thr | Cys | Val | Lys | Lys | Cys | Pro | Arg | Asn | Tyr | Val | 290 | 295 | 300 |
| Val | Thr | Asp | His | Gly | Ser | Cys | Val | Arg | Ala | Cys | Gly | Ala | Asp | Ser | 305 | 310 | 315 |
| Tyr | Glu | Met | Glu | Glu | Asp | Gly | Val | Arg | Lys | Cys | Lys | Lys | Cys | Glu | 320 | 325 | 330 |
| Gly | Pro | Cys | Arg | Lys | Val | Cys | Asn | Gly | Ile | Gly | Ile | Gly | Glu | Phe | 335 | 340 | 345 |
| Lys | Asp | Ser | Leu | Ser | Ile | Asn | Ala | Thr | Asn | Ile | Lys | His | Phe | Lys | 350 | 355 | 360 |
| Asn | Cys | Thr | Ser | Ile | Ser | Gly | Asp | Leu | His | Ile | Leu | Pro | Val | Ala | 365 | 370 | 375 |
| Phe | Arg | Gly | Asp | Ser | Phe | Thr | His | Thr | Pro | Pro | Leu | Asp | Pro | Gln | 380 | 385 | 390 |
| Glu | Leu | Asp | Ile | Leu | Lys | Thr | Val | Lys | Glu | Ile | Thr | Gly | Phe | Leu | 395 | 400 | 405 |
| Leu | Ile | Gln | Ala | Trp | Pro | Glu | Asn | Arg | Thr | Asp | Leu | His | Ala | Phe | 410 | 415 | 420 |
| Glu | Asn | Leu | Glu | Ile | Ile | Arg | Gly | Arg | Thr | Lys | Gln | His | Gly | Gln | 425 | 430 | 435 |
| Phe | Ser | Leu | Ala | Val | Val | Ser | Leu | Asn | Ile | Thr | Ser | Leu | Gly | Leu | 440 | 445 | 450 |
| Arg | Ser | Leu | Lys | Glu | Ile | Ser | Asp | Gly | Asp | Val | Ile | Ile | Ser | Gly | 455 | 460 | 465 |
| Asn | Lys | Asn | Leu | Cys | Tyr | Ala | Asn | Thr | Ile | Asn | Trp | Lys | Lys | Leu | 470 | 475 | 480 |
| Phe | Gly | Thr | Ser | Gly | Gln | Lys | Thr | Lys | Ile | Ile | Ser | Asn | Arg | Gly | 485 | 490 | 495 |
| Glu | Asn | Ser | Cys | Lys | Ala | Thr | Gly | Gln | Val | Cys | His | Ala | Leu | Cys | 500 | 505 | 510 |
| Ser | Pro | Glu | Gly | Cys | Trp | Gly | Pro | Glu | Pro | Arg | Asp | Cys | Val | Ser | 515 | 520 | 525 |
| Cys | Arg | Asn | Val | Ser | Arg | Gly | Arg | Glu | Cys | Val | Asp | Lys | Cys | Asn | 530 | 535 | 540 |
| Leu | Leu | Glu | Gly | Glu | Pro | Arg | Glu | Phe | Val | Glu | Asn | Ser | Glu | Cys | 545 | 550 | 555 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Gln | Cys | His | Pro | Glu | Cys | Leu | Pro | Gln | Ala | Met | Asn | Ile | Thr | 560 | 565 | 570 |
| Cys | Thr | Gly | Arg | Gly | Pro | Asp | Asn | Cys | Ile | Gln | Cys | Ala | His | Tyr | 575 | 580 | 585 |
| Ile | Asp | Gly | Pro | His | Cys | Val | Lys | Thr | Cys | Pro | Ala | Gly | Val | Met | 590 | 595 | 600 |
| Gly | Glu | Asn | Asn | Thr | Leu | Val | Trp | Lys | Tyr | Ala | Asp | Ala | Gly | His | 605 | 610 | 615 |
| Val | Cys | His | Leu | Cys | His | Pro | Asn | Cys | Thr | Tyr | Gly | Cys | Thr | Gly | 620 | 625 | 630 |
| Pro | Gly | Leu | Glu | Gly | Cys | Pro | Thr | Asn | Gly | Pro | Lys | Ile | Pro | Ser | 635 | 640 | 645 |
| Ile | Ala | Thr | Gly | Met | Val | Gly | Ala | Leu | Leu | Leu | Leu | Val | Val |     | 650 | 655 | 660 |
| Ala | Leu | Gly | Ile | Gly | Leu | Phe | Met | Arg | Arg | Arg | His | Ile | Val | Arg | 665 | 670 | 675 |
| Lys | Arg | Thr | Leu | Arg | Arg | Leu | Leu | Gln | Glu | Arg | Glu | Leu | Val | Glu | 680 | 685 | 690 |
| Pro | Leu | Thr | Pro | Ser | Gly | Glu | Ala | Pro | Asn | Gln | Ala | Leu | Leu | Arg | 695 | 700 | 705 |
| Ile | Leu | Lys | Glu | Thr | Glu | Phe | Lys | Lys | Ile | Lys | Val | Leu | Gly | Ser | 710 | 715 | 720 |
| Gly | Ala | Phe | Gly | Thr | Val | Tyr | Lys | Gly | Leu | Trp | Ile | Pro | Glu | Gly | 725 | 730 | 735 |
| Glu | Lys | Val | Lys | Ile | Pro | Val | Ala | Ile | Lys | Glu | Leu | Arg | Glu | Ala | 740 | 745 | 750 |
| Thr | Ser | Pro | Lys | Ala | Asn | Lys | Glu | Ile | Leu | Asp | Glu | Ala | Tyr | Val | 755 | 760 | 765 |
| Met | Ala | Ser | Val | Asp | Asn | Pro | His | Val | Cys | Arg | Leu | Leu | Gly | Ile | 770 | 775 | 780 |
| Cys | Leu | Thr | Ser | Thr | Val | Gln | Leu | Ile | Thr | Gln | Leu | Met | Pro | Phe | 785 | 790 | 795 |
| Gly | Cys | Leu | Leu | Asp | Tyr | Val | Arg | Glu | His | Lys | Asp | Asn | Ile | Gly | 800 | 805 | 810 |
| Ser | Gln | Tyr | Leu | Leu | Asn | Trp | Cys | Val | Gln | Ile | Ala | Lys | Gly | Met | 815 | 820 | 825 |
| Asn | Tyr | Leu | Glu | Asp | Arg | Arg | Leu | Val | His | Arg | Asp | Leu | Ala | Ala | 830 | 835 | 840 |
| Arg | Asn | Val | Leu | Val | Lys | Thr | Pro | Gln | His | Val | Lys | Ile | Thr | Asp | 845 | 850 | 855 |
| Phe | Gly | Leu | Ala | Lys | Leu | Leu | Gly | Ala | Glu | Glu | Lys | Glu | Tyr | His |     |     |     |

| 860 |     |     |     |      | 865 |     |     |     |      | 870 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Ala | Glu | Gly | Gly | Lys  | Val | Pro | Ile | Lys | Trp  | Met | Ala | Leu | Glu | Ser  |
|     |     |     |     | 875  |     |     |     |     | 880  |     |     |     |     | 885  |
| Ile | Leu | His | Arg | Ile  | Tyr | Thr | His | Gln | Ser  | Asp | Val | Trp | Ser | Tyr  |
|     |     |     |     | 890  |     |     |     |     | 895  |     |     |     |     | 900  |
| Gly | Val | Thr | Val | Trp  | Glu | Leu | Met | Thr | Phe  | Gly | Ser | Lys | Pro | Tyr  |
|     |     |     |     | 905  |     |     |     |     | 910  |     |     |     |     | 915  |
| Asp | Gly | Ile | Pro | Ala  | Ser | Glu | Ile | Ser | Ser  | Ile | Leu | Glu | Lys | Gly  |
|     |     |     |     | 920  |     |     |     |     | 925  |     |     |     |     | 930  |
| Glu | Arg | Leu | Pro | Gln  | Pro | Pro | Ile | Cys | Thr  | Ile | Asp | Val | Tyr | Met  |
|     |     |     |     | 935  |     |     |     |     | 940  |     |     |     |     | 945  |
| Ile | Met | Val | Lys | Cys  | Trp | Met | Ile | Asp | Ala  | Asp | Ser | Arg | Pro | Lys  |
|     |     |     |     | 950  |     |     |     |     | 955  |     |     |     |     | 960  |
| Phe | Arg | Glu | Leu | Ile  | Ile | Glu | Phe | Ser | Lys  | Met | Ala | Arg | Asp | Pro  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Gln | Arg | Tyr | Leu | Val  | Ile | Gln | Gly | Asp | Glu  | Arg | Met | His | Leu | Pro  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Ser | Pro | Thr | Asp | Ser  | Asn | Phe | Tyr | Arg | Ala  | Leu | Met | Asp | Glu | Glu  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Asp | Met | Asp | Asp | Val  | Val | Asp | Ala | Asp | Glu  | Tyr | Leu | Ile | Pro | Gln  |
|     |     |     |     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |
| Gln | Gly | Phe | Phe | Ser  | Ser | Pro | Ser | Thr | Ser  | Arg | Thr | Pro | Leu | Leu  |
|     |     |     |     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |
| Ser | Ser | Leu | Ser | Ala  | Thr | Ser | Asn | Asn | Ser  | Thr | Val | Ala | Cys | Ile  |
|     |     |     |     | 1040 |     |     |     |     | 1045 |     |     |     |     | 1050 |
| Asp | Arg | Asn | Gly | Leu  | Gln | Ser | Cys | Pro | Ile  | Lys | Glu | Asp | Ser | Phe  |
|     |     |     |     | 1055 |     |     |     |     | 1060 |     |     |     |     | 1065 |
| Leu | Gln | Arg | Tyr | Ser  | Ser | Asp | Pro | Thr | Gly  | Ala | Leu | Thr | Glu | Asp  |
|     |     |     |     | 1070 |     |     |     |     | 1075 |     |     |     |     | 1080 |
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| His | Trp | Ala | Gln | Lys  | Gly | Ser | His | Gln | Ile  | Ser | Leu | Asp | Asn | Pro  |
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| Tyr Gly Gly Cys | Met Ser Leu Ile Ala Val | Arg Val Phe Tyr Arg | 185 | 190 | 195 |
| Lys Cys Pro Arg | Ile Ile Gln Asn Gly Ala | Ile Phe Gln Glu Thr | 200 | 205 | 210 |
| Leu Ser Gly Ala | Glu Ser Thr Ser Leu Val | Ala Ala Arg Gly Ser | 215 | 220 | 225 |
| Cys Ile Ala Asn | Ala Glu Glu Val Asp Val | Pro Ile Lys Leu Tyr | 230 | 235 | 240 |
| Cys Asn Gly Asp | Gly Glu Trp Leu Val Pro | Ile Gly Arg Cys Met | 245 | 250 | 255 |
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| Thr Asn Cys Val | Cys Arg Asn Gly Tyr Tyr | Arg Ala Asp Leu Asp | 305 | 310 | 315 |
| Pro Leu Asp Met | Pro Cys Thr Thr Ile Pro | Ser Ala Pro Gln Ala | 320 | 325 | 330 |
| Val Ile Ser Ser | Val Asn Glu Thr Ser Leu | Met Leu Glu Trp Thr | 335 | 340 | 345 |
| Pro Pro Arg Asp | Ser Gly Gly Arg Glu Asp | Leu Val Tyr Asn Ile | 350 | 355 | 360 |
| Ile Cys Lys Ser | Cys Gly Ser Gly Arg Gly | Ala Cys Thr Arg Cys | 365 | 370 | 375 |
| Gly Asp Asn Val | Gln Tyr Ala Pro Arg Gln | Leu Gly Leu Thr Glu | 380 | 385 | 390 |
| Pro Arg Ile Tyr | Ile Ser Asp Leu Leu Ala | His Thr Gln Tyr Thr | 395 | 400 | 405 |
| Phe Glu Ile Gln | Ala Val Asn Gly Val Thr | Asp Gln Ser Pro Phe | 410 | 415 | 420 |
| Ser Pro Gln Phe | Ala Ser Val Asn Ile Thr | Thr Asn Gln Ala Ala | 425 | 430 | 435 |
| Pro Ser Ala Val | Ser Ile Met His Gln Val | Ser Arg Thr Val Asp | 440 | 445 | 450 |
| Ser Ile Thr Leu | Ser Trp Ser Gln Pro Asp | Gln Pro Asn Gly Val | 455 | 460 | 465 |

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ile | Leu | Asp | Tyr | Glu | Leu | Gln | Tyr | Tyr | Glu | Lys | Glu | Leu | Ser | Glu |  |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Tyr | Asn | Ala | Thr | Ala | Ile | Lys | Ser | Pro | Thr | Asn | Thr | Val | Thr | Val |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |  |
| Gln | Gly | Leu | Lys | Ala | Gly | Ala | Ile | Tyr | Val | Phe | Gln | Val | Arg | Ala |  |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |  |
| Arg | Thr | Val | Ala | Gly | Tyr | Gly | Arg | Tyr | Ser | Gly | Lys | Met | Tyr | Phe |  |
|     |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |  |
| Gln | Thr | Met | Thr | Glu | Ala | Glu | Tyr | Gln | Thr | Ser | Ile | Gln | Glu | Lys |  |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |  |
| Leu | Pro | Leu | Ile | Ile | Gly | Ser | Ser | Ala | Ala | Gly | Leu | Val | Phe | Leu |  |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |  |
| Ile | Ala | Val | Val | Val | Ile | Ala | Ile | Val | Cys | Asn | Arg | Arg | Arg | Gly |  |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |  |
| Phe | Glu | Arg | Ala | Asp | Ser | Glu | Tyr | Thr | Asp | Lys | Leu | Gln | His | Tyr |  |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |  |
| Thr | Ser | Gly | His | Met | Thr | Pro | Gly | Met | Lys | Ile | Tyr | Ile | Asp | Pro |  |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |  |
| Phe | Thr | Tyr | Glu | Asp | Pro | Asn | Glu | Ala | Val | Arg | Glu | Phe | Ala | Lys |  |
|     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |  |
| Glu | Ile | Asp | Ile | Ser | Cys | Val | Lys | Ile | Glu | Gln | Val | Ile | Gly | Ala |  |
|     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     | 630 |  |
| Gly | Glu | Phe | Gly | Glu | Val | Cys | Ser | Gly | His | Leu | Lys | Leu | Pro | Gly |  |
|     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     | 645 |  |
| Lys | Arg | Glu | Ile | Phe | Val | Ala | Ile | Lys | Thr | Leu | Lys | Ser | Gly | Tyr |  |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |  |
| Thr | Glu | Lys | Gln | Arg | Arg | Asp | Phe | Leu | Ser | Glu | Ala | Ser | Ile | Met |  |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |  |
| Gly | Gln | Phe | Asp | His | Pro | Asn | Val | Ile | His | Leu | Glu | Gly | Val | Val |  |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |  |
| Thr | Lys | Ser | Thr | Pro | Val | Met | Ile | Ile | Thr | Glu | Phe | Met | Glu | Asn |  |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |  |
| Gly | Ser | Leu | Asp | Ser | Phe | Leu | Arg | Gln | Asn | Asp | Gly | Gln | Phe | Thr |  |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |  |
| Val | Ile | Gln | Leu | Val | Gly | Met | Leu | Arg | Gly | Ile | Ala | Ala | Gly | Met |  |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |  |
| Lys | Tyr | Leu | Ala | Asp | Met | Asn | Tyr | Val | His | Arg | Asp | Leu | Ala | Ala |  |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |  |
| Arg | Asn | Ile | Leu | Val | Asn | Ser | Asn | Leu | Val | Cys | Lys | Val | Ser | Asp |  |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |  |
| Phe | Gly | Leu | Ser | Arg | Phe | Leu | Glu | Asp | Asp | Thr | Ser | Asp | Pro | Thr |  |

| 770 |     |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Thr | Ser | Ala | Leu | Gly | Gly | Lys | Ile | Pro | Ile | Arg | Trp | Thr | Ala |
|     |     |     |     | 785 |     |     |     |     | 790 |     |     |     |     | 795 |
| Pro | Glu | Ala | Ile | Gln | Tyr | Arg | Lys | Phe | Thr | Ser | Ala | Ser | Asp | Val |
|     |     |     |     | 800 |     |     |     |     | 805 |     |     |     |     | 810 |
| Trp | Ser | Tyr | Gly | Ile | Val | Met | Trp | Glu | Val | Met | Ser | Tyr | Gly | Glu |
|     |     |     |     | 815 |     |     |     |     | 820 |     |     |     |     | 825 |
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|     |     |     |     | 830 |     |     |     |     | 835 |     |     |     |     | 840 |
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| Leu | His | Gln | Leu | Met | Leu | Asp | Cys | Trp | Gln | Lys | Asp | Arg | Asn | His |
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| Arg | Pro | Lys | Phe | Gly | Gln | Ile | Val | Asn | Thr | Leu | Asp | Lys | Met | Ile |
|     |     |     |     | 875 |     |     |     |     | 880 |     |     |     |     | 885 |
| Arg | Asn | Pro | Asn | Ser | Leu | Lys | Ala | Met | Ala | Pro | Leu | Ser | Ser | Gly |
|     |     |     |     | 890 |     |     |     |     | 895 |     |     |     |     | 900 |
| Ile | Asn | Leu | Pro | Leu | Leu | Asp | Arg | Thr | Ile | Pro | Asp | Tyr | Thr | Ser |
|     |     |     |     | 905 |     |     |     |     | 910 |     |     |     |     | 915 |
| Phe | Asn | Thr | Val | Asp | Glu | Trp | Leu | Glu | Ala | Ile | Lys | Met | Gly | Gln |
|     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |     | 930 |
| Tyr | Lys | Glu | Ser | Phe | Ala | Asn | Ala | Gly | Phe | Thr | Ser | Phe | Asp | Val |
|     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     | 945 |
| Val | Ser | Gln | Met | Met | Met | Glu | Asp | Ile | Leu | Arg | Val | Gly | Val | Thr |
|     |     |     |     | 950 |     |     |     |     | 955 |     |     |     |     | 960 |
| Leu | Ala | Gly | His | Gln | Lys | Lys | Ile | Leu | Asn | Ser | Ile | Gln | Val | Met |
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| Arg | Ala | Gln | Met | Asn | Gln | Ile | Gln | Ser | Val | Glu | Val |     |     |     |
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<210> 58  
<211> 188  
<212> PRT  
<213> Homo sapien

<400> 58  
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35 40 45  
Phe Arg Asp Asp Ser Ile Trp Pro Gln Glu Glu Pro Ala Ile Arg  
50 55 60  
Pro Arg Ser Ser Gln Arg Val Pro Pro Met Gly Ile Gln His Ser  
65 70 75  
Lys Glu Leu Asn Arg Thr Cys Cys Leu Asn Gly Gly Thr Cys Met  
80 85 90  
Leu Gly Ser Phe Cys Ala Cys Pro Pro Ser Phe Tyr Gly Arg Asn  
95 100 105  
Cys Glu His Asp Val Arg Lys Glu Asn Cys Gly Ser Val Pro His  
110 115 120  
Asp Thr Trp Leu Pro Lys Lys Cys Ser Leu Cys Lys Cys Trp His  
125 130 135  
Gly Gln Leu Arg Cys Phe Pro Gln Ala Phe Leu Pro Gly Cys Asp  
140 145 150  
Gly Leu Val Met Asp Glu His Leu Val Ala Ser Arg Thr Pro Glu  
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170 175 180  
Cys Leu Ser Ile Gln Ser Tyr Tyr  
185

<210> 59  
<211> 3346  
<212> DNA  
<213> Homo sapien

<400> 59

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<210> 60  
<211> 346  
<212> PRT  
<213> Homo sapien

<400> 60  
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Met Val Val Trp Ala Leu Cys Arg Leu Ala Thr Pro Leu Ala Lys  
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Asn Leu Glu Pro Val Ser Trp Ser Ser Leu Asn Pro Lys Phe Leu  
35 40 45  
Ser Gly Lys Gly Leu Val Ile Tyr Pro Lys Ile Gly Asp Lys Leu  
50 55 60  
Asp Ile Ile Cys Pro Arg Ala Glu Ala Gly Arg Pro Tyr Glu Tyr  
65 70 75  
Tyr Lys Leu Tyr Leu Val Arg Pro Glu Gln Ala Ala Ala Cys Ser  
80 85 90  
Thr Val Leu Asp Pro Asn Val Leu Val Thr Cys Asn Arg Pro Glu  
95 100 105  
Gln Glu Ile Arg Phe Thr Ile Lys Phe Gln Glu Phe Ser Pro Asn  
110 115 120  
Tyr Met Gly Leu Glu Phe Lys Lys His His Asp Tyr Tyr Ile Thr  
125 130 135  
Ser Thr Ser Asn Gly Ser Leu Glu Gly Leu Glu Asn Arg Glu Gly  
140 145 150  
Gly Val Cys Arg Thr Arg Thr Met Lys Ile Ile Met Lys Val Gly  
155 160 165  
Gln Asp Pro Asn Ala Val Thr Pro Glu Gln Leu Thr Thr Ser Arg  
170 175 180  
Pro Ser Lys Glu Ala Asp Asn Thr Val Lys Met Ala Thr Gln Ala  
185 190 195  
Pro Gly Ser Arg Gly Ser Leu Gly Asp Ser Asp Gly Lys His Glu  
200 205 210  
Thr Val Asn Gln Glu Glu Lys Ser Gly Pro Gly Ala Ser Gly Gly

| 215 |     |     |     |     |     |     |     |     |     | 220 |     |     |     |     | 225 |  |  |  |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|--|--|
| Ser | Ser | Gly | Asp | Pro | Asp | Gly | Phe | Phe | Asn | Ser | Lys | Val | Ala | Leu |     |  |  |  |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |     |  |  |  |  |
| Phe | Ala | Ala | Val | Gly | Ala | Gly | Cys | Val | Ile | Phe | Leu | Leu | Ile | Ile |     |  |  |  |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |  |  |  |
| Ile | Phe | Leu | Thr | Val | Leu | Leu | Leu | Lys | Leu | Arg | Lys | Arg | His | Arg |     |  |  |  |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |  |  |  |  |
| Lys | His | Thr | Gln | Gln | Arg | Ala | Ala | Ala | Leu | Ser | Leu | Ser | Thr | Leu |     |  |  |  |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |  |  |  |  |
| Ala | Ser | Pro | Lys | Gly | Gly | Ser | Gly | Thr | Ala | Gly | Thr | Glu | Pro | Ser |     |  |  |  |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |     |  |  |  |  |
| Asp | Ile | Ile | Ile | Pro | Leu | Arg | Thr | Thr | Glu | Asn | Asn | Tyr | Cys | Pro |     |  |  |  |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |  |  |  |  |
| His | Tyr | Glu | Lys | Val | Ser | Gly | Asp | Tyr | Gly | His | Pro | Val | Tyr | Ile |     |  |  |  |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |     |  |  |  |  |
| Val | Gln | Glu | Met | Pro | Pro | Gln | Ser | Pro | Ala | Asn | Ile | Tyr | Tyr | Lys |     |  |  |  |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |     |  |  |  |  |

Val

<210> 61  
 <211> 2438  
 <212> DNA  
 <213> Homo sapien

<400> 61  
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 tgcggcgccg cgcagcccgg ggaccgggcc cgccgcccc aggcccga 150  
 ctctcgcggt tgccgtgct gccgtgccg ctgctgctgc tgctggcgct 200  
 ggggaccgc gggggctgc ccgcgccgc accgcgcgc gcgcgcgagg 250  
 acctcagcct gggagtggag tggctaagca ggttcggtta cctgcccccg 300  
 gctgacccca caacagggca gctgcagacg caagaggagc tgtctaaggc 350  
 catcacagcc atgcagcagt ttggtggcct ggaggccacc ggcatcctgg 400  
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 ctccctgtcc tgaccaggc tcgcaggaga cgccaggctc cagccccac 500  
 caagtggaac aagaggaacc tgtcgtggag ggtccggacg ttcccacggg 550  
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 aaggtctgga gcgacattgc gccctgaac ttccacgagg tggcgggcag 650

caccgccgac atccagatcg acttctccaa ggccgaccat aacgacggct 700  
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caccaccaca ccgccgggga caccacttt gacgatgacg aggcctggac 800  
cttcgcgtcc tcggatgcc acgggatgga cctgtttgca gtggctgtcc 850  
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<210> 62  
 <211> 606  
 <212> PRT  
 <213> Homo sapien

<400> 62  
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 35 40 45  
 Ala Pro Arg Ala Glu Asp Leu Ser Leu Gly Val Glu Trp Leu Ser  
 50 55 60  
 Arg Phe Gly Tyr Leu Pro Pro Ala Asp Pro Thr Thr Gly Gln Leu  
 65 70 75  
 Gln Thr Gln Glu Glu Leu Ser Lys Ala Ile Thr Ala Met Gln Gln  
 80 85 90  
 Phe Gly Gly Leu Glu Ala Thr Gly Ile Leu Asp Glu Ala Thr Leu  
 95 100 105  
 Ala Leu Met Lys Thr Pro Arg Cys Ser Leu Pro Asp Leu Pro Val  
 110 115 120  
 Leu Thr Gln Ala Arg Arg Arg Arg Gln Ala Pro Ala Pro Thr Lys  
 125 130 135  
 Trp Asn Lys Arg Asn Leu Ser Trp Arg Val Arg Thr Phe Pro Arg  
 140 145 150  
 Asp Ser Pro Leu Gly His Asp Thr Val Arg Ala Leu Met Tyr Tyr  
 155 160 165  
 Ala Leu Lys Val Trp Ser Asp Ile Ala Pro Leu Asn Phe His Glu  
 170 175 180  
 Val Ala Gly Ser Thr Ala Asp Ile Gln Ile Asp Phe Ser Lys Ala  
 185 190 195  
 Asp His Asn Asp Gly Tyr Pro Phe Asp Gly Pro Gly Gly Thr Val  
 200 205 210  
 Ala His Ala Phe Phe Pro Gly His His His Thr Ala Gly Asp Thr  
 215 220 225

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| His | Phe | Asp | Asp | Asp | Glu | Ala | Trp | Thr | Phe | Arg | Ser | Ser | Asp | Ala | 230 | 235 | 240 |
| His | Gly | Met | Asp | Leu | Phe | Ala | Val | Ala | Val | His | Glu | Phe | Gly | His | 245 | 250 | 255 |
| Ala | Ile | Gly | Leu | Ser | His | Val | Ala | Ala | Ala | His | Ser | Ile | Met | Arg | 260 | 265 | 270 |
| Pro | Tyr | Tyr | Gln | Gly | Pro | Val | Gly | Asp | Pro | Leu | Arg | Tyr | Gly | Leu | 275 | 280 | 285 |
| Pro | Tyr | Glu | Asp | Lys | Val | Arg | Val | Trp | Gln | Leu | Tyr | Gly | Val | Arg | 290 | 295 | 300 |
| Glu | Ser | Val | Ser | Pro | Thr | Ala | Gln | Pro | Glu | Glu | Pro | Pro | Leu | Leu | 305 | 310 | 315 |
| Pro | Glu | Pro | Pro | Asp | Asn | Arg | Ser | Ser | Ala | Pro | Pro | Arg | Lys | Asp | 320 | 325 | 330 |
| Val | Pro | His | Arg | Cys | Ser | Thr | His | Phe | Asp | Ala | Val | Ala | Gln | Ile | 335 | 340 | 345 |
| Arg | Gly | Glu | Ala | Phe | Phe | Phe | Lys | Gly | Lys | Tyr | Phe | Trp | Arg | Leu | 350 | 355 | 360 |
| Thr | Arg | Asp | Arg | His | Leu | Val | Ser | Leu | Gln | Pro | Ala | Gln | Met | His | 365 | 370 | 375 |
| Arg | Phe | Trp | Arg | Gly | Leu | Pro | Leu | His | Leu | Asp | Ser | Val | Asp | Ala | 380 | 385 | 390 |
| Val | Tyr | Glu | Arg | Thr | Ser | Asp | His | Lys | Ile | Val | Phe | Phe | Lys | Gly | 395 | 400 | 405 |
| Asp | Arg | Tyr | Trp | Val | Phe | Lys | Asp | Asn | Asn | Val | Glu | Glu | Gly | Tyr | 410 | 415 | 420 |
| Pro | Arg | Pro | Val | Ser | Asp | Phe | Ser | Leu | Pro | Pro | Gly | Gly | Ile | Asp | 425 | 430 | 435 |
| Ala | Ala | Phe | Ser | Trp | Ala | His | Asn | Asp | Arg | Thr | Tyr | Phe | Phe | Lys | 440 | 445 | 450 |
| Asp | Gln | Leu | Tyr | Trp | Arg | Tyr | Asp | Asp | His | Thr | Arg | His | Met | Asp | 455 | 460 | 465 |
| Pro | Gly | Tyr | Pro | Ala | Gln | Ser | Pro | Leu | Trp | Arg | Gly | Val | Pro | Ser | 470 | 475 | 480 |
| Thr | Leu | Asp | Asp | Ala | Met | Arg | Trp | Ser | Asp | Gly | Ala | Ser | Tyr | Phe | 485 | 490 | 495 |
| Phe | Arg | Gly | Gln | Glu | Tyr | Trp | Lys | Val | Leu | Asp | Gly | Glu | Leu | Glu | 500 | 505 | 510 |
| Val | Ala | Pro | Gly | Tyr | Pro | Gln | Ser | Thr | Ala | Arg | Asp | Trp | Leu | Val | 515 | 520 | 525 |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Cys | Gly | Asp | Ser | Gln | Ala | Asp | Gly | Ser | Val | Ala | Ala | Gly | Val | Asp |  |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |  |
| Ala | Ala | Glu | Gly | Pro | Arg | Ala | Pro | Pro | Gly | Gln | His | Asp | Gln | Ser |  |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |  |
| Arg | Ser | Glu | Asp | Gly | Tyr | Glu | Val | Cys | Ser | Cys | Thr | Ser | Gly | Ala |  |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |  |
| Ser | Ser | Pro | Pro | Gly | Ala | Pro | Gly | Pro | Leu | Val | Ala | Ala | Thr | Met |  |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |  |
| Leu | Leu | Leu | Leu | Pro | Pro | Leu | Ser | Pro | Gly | Ala | Leu | Trp | Thr | Ala |  |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |  |
| Ala | Gln | Ala | Leu | Thr | Leu |     |     |     |     |     |     |     |     |     |  |
|     |     |     |     | 605 |     |     |     |     |     |     |     |     |     |     |  |

<210> 63  
 <211> 1009  
 <212> DNA  
 <213> Homo sapien

<400> 63  
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 cttgccctgg tgtttcgccg ttccagtgcc cctgctgca gaccataaag 100  
 gatgggactt tgttgagggc tatttccatc aatttttctt gaccgagaag 150  
 gagtcgccac tccttaccca ggagacacaa acacagctcc tgcaacaatt 200  
 ccatcggaat gggacagacc tacttgacat gcagatgcat gctctgctac 250  
 accagcccca ctgtggggtg cctgatgggt ccgacacctc catctcgcca 300  
 ggaagatgca agtgggaataa gcacactcta acttacagga ttatcaatta 350  
 cccacatgat atgaagccat ccgcagtga agacagtata tataatgcag 400  
 tttccatctg gagcaatgtg acccctttga tattccagca agtgcagaat 450  
 ggagatgcag acatcaaggt ttctttctgg cagtgggccc atgaagatgg 500  
 ttggcccttt gatgggccag gtggtatctt aggccatgcc tttttaccaa 550  
 attctggaaa tcctggagtt gtccattttg acaagaatga aactgggtca 600  
 gcttcagaca ctggatataa tctgttcctg gttgcaactc atgagattgg 650  
 gcattctttg ggcctgcagc actctgggaa tcagagctcc ataatgtacc 700  
 ccacttactg gtatcacgac cctagaacct tccagctcag tgccgatgat 750  
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 atgaagccct aaagaatgca acctagtcag gttagctgaa ccgacactca 950

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<210> 64

<211> 261

<212> PRT

<213> Homo sapien

<400> 64

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Gln | Leu | Val | Ile | Leu | Arg | Val | Thr | Ile | Phe | Leu | Pro | Trp | Cys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Ala | Val | Pro | Val | Pro | Pro | Ala | Ala | Asp | His | Lys | Gly | Trp | Asp |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Val | Glu | Gly | Tyr | Phe | His | Gln | Phe | Phe | Leu | Thr | Glu | Lys | Glu |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Pro | Leu | Leu | Thr | Gln | Glu | Thr | Gln | Thr | Gln | Leu | Leu | Gln | Gln |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | His | Arg | Asn | Gly | Thr | Asp | Leu | Leu | Asp | Met | Gln | Met | His | Ala |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Leu | His | Gln | Pro | His | Cys | Gly | Val | Pro | Asp | Gly | Ser | Asp | Thr |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ile | Ser | Pro | Gly | Arg | Cys | Lys | Trp | Asn | Lys | His | Thr | Leu | Thr |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Tyr | Arg | Ile | Ile | Asn | Tyr | Pro | His | Asp | Met | Lys | Pro | Ser | Ala | Val |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Asp | Ser | Ile | Tyr | Asn | Ala | Val | Ser | Ile | Trp | Ser | Asn | Val | Thr |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Leu | Ile | Phe | Gln | Gln | Val | Gln | Asn | Gly | Asp | Ala | Asp | Ile | Lys |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ser | Phe | Trp | Gln | Trp | Ala | His | Glu | Asp | Gly | Trp | Pro | Phe | Asp |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Pro | Gly | Gly | Ile | Leu | Gly | His | Ala | Phe | Leu | Pro | Asn | Ser | Gly |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Pro | Gly | Val | Val | His | Phe | Asp | Lys | Asn | Glu | His | Trp | Ser | Ala |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Asp | Thr | Gly | Tyr | Asn | Leu | Phe | Leu | Val | Ala | Thr | His | Glu | Ile |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | His | Ser | Leu | Gly | Leu | Gln | His | Ser | Gly | Asn | Gln | Ser | Ser | Ile |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Tyr | Pro | Thr | Tyr | Trp | Tyr | His | Asp | Pro | Arg | Thr | Phe | Gln | Leu |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ala | Asp | Asp | Ile | Gln | Arg | Ile | Gln | His | Leu | Tyr | Gly | Glu | Lys |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |

Cys Ser Ser Asp Ile Pro  
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<210> 65

<211> 3410

<212> DNA

<213> Homo sapien

<400> 65

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cctcgaattc 3410

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<211> 748  
<212> PRT  
<213> Homo sapien

<400> 66  
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Gly Met Gly Gly Gln Tyr Gly Asn Pro Leu Asn Lys Tyr Ile Arg  
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His Tyr Glu Gly Leu Ser Tyr Asn Val Asp Ser Leu His Gln Lys  
35 40 45  
His Gln Arg Ala Lys Arg Ala Val Ser His Glu Asp Gln Phe Leu  
50 55 60  
Arg Leu Asp Phe His Ala His Gly Arg His Phe Asn Leu Arg Met  
65 70 75  
Lys Arg Asp Thr Ser Leu Phe Ser Asp Glu Phe Lys Val Glu Thr  
80 85 90  
Ser Asn Lys Val Leu Asp Tyr Asp Thr Ser His Ile Tyr Thr Gly  
95 100 105  
His Ile Tyr Gly Glu Glu Gly Ser Phe Ser His Gly Ser Val Ile  
110 115 120  
Asp Gly Arg Phe Glu Gly Phe Ile Gln Thr Arg Gly Gly Thr Phe  
125 130 135  
Tyr Val Glu Pro Ala Glu Arg Tyr Ile Lys Asp Arg Thr Leu Pro  
140 145 150

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Phe | His | Ser | Val | Ile | Tyr | His | Glu | Asp | Asp | Ile | Asn | Tyr | Pro | His |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Lys | Tyr | Gly | Pro | Gln | Gly | Gly | Cys | Ala | Asp | His | Ser | Val | Phe | Glu |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Arg | Met | Arg | Lys | Tyr | Gln | Met | Thr | Gly | Val | Glu | Glu | Val | Thr | Gln |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Ile | Pro | Gln | Glu | Glu | His | Ala | Ala | Asn | Gly | Pro | Glu | Leu | Leu | Arg |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Lys | Lys | Arg | Thr | Thr | Ser | Ala | Glu | Lys | Asn | Thr | Cys | Gln | Leu | Tyr |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Ile | Gln | Thr | Asp | His | Leu | Phe | Phe | Lys | Tyr | Tyr | Gly | Thr | Arg | Glu |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ala | Val | Ile | Ala | Gln | Ile | Ser | Ser | His | Val | Lys | Ala | Ile | Asp | Thr |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Ile | Tyr | Gln | Thr | Thr | Asp | Phe | Ser | Gly | Ile | Arg | Asn | Ile | Ser | Phe |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Met | Val | Lys | Arg | Ile | Arg | Ile | Asn | Thr | Thr | Ala | Asp | Glu | Lys | Asp |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Pro | Thr | Asn | Pro | Phe | Arg | Phe | Pro | Asn | Ile | Gly | Val | Glu | Lys | Phe |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Leu | Glu | Leu | Asn | Ser | Glu | Gln | Asn | His | Asp | Asp | Tyr | Cys | Leu | Ala |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Tyr | Val | Phe | Thr | Asp | Arg | Asp | Phe | Asp | Asp | Gly | Val | Leu | Gly | Leu |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Ala | Trp | Val | Gly | Ala | Pro | Ser | Gly | Ser | Ser | Gly | Gly | Ile | Cys | Glu |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Lys | Ser | Lys | Leu | Tyr | Ser | Asp | Gly | Lys | Lys | Lys | Ser | Leu | Asn | Thr |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Gly | Ile | Ile | Thr | Val | Gln | Asn | Tyr | Gly | Ser | His | Val | Pro | Pro | Lys |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Val | Ser | His | Ile | Thr | Phe | Ala | His | Glu | Val | Gly | His | Asn | Phe | Gly |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Ser | Pro | His | Asp | Ser | Gly | Thr | Glu | Cys | Thr | Pro | Gly | Glu | Ser | Lys |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Asn | Leu | Gly | Gln | Lys | Glu | Asn | Gly | Asn | Tyr | Ile | Met | Tyr | Ala | Arg |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |
| Ala | Thr | Ser | Gly | Asp | Lys | Leu | Asn | Asn | Asn | Lys | Phe | Ser | Leu | Cys |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |
| Ser | Ile | Arg | Asn | Ile | Ser | Gln | Val | Leu | Glu | Lys | Lys | Arg | Asn | Asn |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Phe | Val | Glu | Ser | Gly | Gln | Pro | Ile | Cys | Gly | Asn | Gly | Met | Val | 455 | 460 | 465 |
| Glu | Gln | Gly | Glu | Glu | Cys | Asp | Cys | Gly | Tyr | Ser | Asp | Gln | Cys | Lys | 470 | 475 | 480 |
| Asp | Glu | Cys | Cys | Phe | Asp | Ala | Asn | Gln | Pro | Glu | Gly | Arg | Lys | Cys | 485 | 490 | 495 |
| Lys | Leu | Lys | Pro | Gly | Lys | Gln | Cys | Ser | Pro | Ser | Gln | Gly | Pro | Cys | 500 | 505 | 510 |
| Cys | Thr | Ala | Gln | Cys | Ala | Phe | Lys | Ser | Lys | Ser | Glu | Lys | Cys | Arg | 515 | 520 | 525 |
| Asp | Asp | Ser | Asp | Cys | Ala | Arg | Glu | Gly | Ile | Cys | Asn | Gly | Phe | Thr | 530 | 535 | 540 |
| Ala | Leu | Cys | Pro | Ala | Ser | Asp | Pro | Lys | Pro | Asn | Phe | Thr | Asp | Cys | 545 | 550 | 555 |
| Asn | Arg | His | Thr | Gln | Val | Cys | Ile | Asn | Gly | Gln | Cys | Ala | Gly | Ser | 560 | 565 | 570 |
| Ile | Cys | Glu | Lys | Tyr | Gly | Leu | Glu | Glu | Cys | Thr | Cys | Ala | Ser | Ser | 575 | 580 | 585 |
| Asp | Gly | Lys | Asp | Asp | Lys | Glu | Leu | Cys | His | Val | Cys | Cys | Met | Lys | 590 | 595 | 600 |
| Lys | Met | Asp | Pro | Ser | Thr | Cys | Ala | Ser | Thr | Gly | Ser | Val | Gln | Trp | 605 | 610 | 615 |
| Ser | Arg | His | Phe | Ser | Gly | Arg | Thr | Ile | Thr | Leu | Gln | Pro | Gly | Ser | 620 | 625 | 630 |
| Pro | Cys | Asn | Asp | Phe | Arg | Gly | Tyr | Cys | Asp | Val | Phe | Met | Arg | Cys | 635 | 640 | 645 |
| Arg | Leu | Val | Asp | Ala | Asp | Gly | Pro | Leu | Ala | Arg | Leu | Lys | Lys | Ala | 650 | 655 | 660 |
| Ile | Phe | Ser | Pro | Glu | Leu | Tyr | Glu | Asn | Ile | Ala | Glu | Trp | Ile | Val | 665 | 670 | 675 |
| Ala | His | Trp | Trp | Ala | Val | Leu | Leu | Met | Gly | Ile | Ala | Leu | Ile | Met | 680 | 685 | 690 |
| Leu | Met | Ala | Gly | Phe | Ile | Lys | Ile | Cys | Ser | Val | His | Thr | Pro | Ser | 695 | 700 | 705 |
| Ser | Asn | Pro | Lys | Leu | Pro | Pro | Pro | Lys | Pro | Leu | Pro | Gly | Thr | Leu | 710 | 715 | 720 |
| Lys | Arg | Arg | Arg | Pro | Pro | Gln | Pro | Ile | Gln | Gln | Pro | Gln | Arg | Gln | 725 | 730 | 735 |
| Arg | Pro | Arg | Glu | Ser | Tyr | Gln | Met | Gly | His | Met | Arg | Arg |     |     | 740 | 745 |     |

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<211> 13497  
<212> DNA  
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<400> 67  
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| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |
| Ile | Gly | Leu | Pro | Ala | Asp | Gly | Phe | Arg | Leu | Phe | Arg | Arg | Gly | Ala |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Ala | Trp | Gln | Thr | Leu | Phe | Leu | Leu | Cys | Ala | Leu | Ala | Tyr | Cys | Ile |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Asn | Glu | Ala | Ser | Ser | Glu | Gly | Arg | Val | Val | Cys | Tyr | Tyr | Thr | Asn |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Trp | Ser | Val | Tyr | Arg | Pro | Gly | Thr | Ala | Lys | Phe | Asn | Pro | Gln | Asn |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Ile | Asn | Pro | Tyr | Leu | Cys | Thr | His | Leu | Val | Tyr | Ala | Phe | Gly | Gly |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Phe | Thr | Lys | Asp | Asn | Gln | Met | Lys | Pro | Phe | Asp | Lys | Tyr | Gln | Asp |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Ile | Glu | Gln | Gly | Gly | Tyr | Ala | Lys | Phe | Thr | Gly | Leu | Lys | Thr | Tyr |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| Asn | Lys | Gln | Leu | Lys | Thr | Met | Ile | Ala | Ile | Gly | Gly | Trp | Asn | Glu |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Ala | Ser | Ser | Arg | Phe | Ser | Pro | Leu | Val | Ala | Ser | Asn | Glu | Arg | Arg |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Gln | Gln | Phe | Ile | Lys | Asn | Ile | Leu | Lys | Phe | Leu | Arg | Gln | Asn | His |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Phe | Asp | Gly | Ile | Asp | Leu | Asp | Trp | Glu | Tyr | Pro | Ala | His | Arg | Glu |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Gly | Gly | Lys | Ser | Arg | Asp | Arg | Asp | Asn | Tyr | Ala | Gln | Phe | Val | Gln |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Glu | Leu | Arg | Ala | Glu | Phe | Glu | Arg | Glu | Ala | Glu | Lys | Thr | Gly | Arg |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Thr | Arg | Leu | Leu | Leu | Thr | Met | Ala | Val | Pro | Ala | Gly | Ile | Glu | Tyr |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Ile | Asp | Lys | Gly | Tyr | Asp | Val | Pro | Lys | Leu | Asn | Lys | Tyr | Leu | Asp |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Trp | Phe | Asn | Val | Leu | Thr | Tyr | Asp | Phe | His | Ser | Ser | His | Glu | Pro |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Ser | Val | Asn | His | His | Ala | Pro | Leu | Tyr | Ser | Leu | Glu | Glu | Asp | Ser |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| Glu | Tyr | Asn | Tyr | Asp | Ala | Glu | Leu | Asn | Ile | Asp | Tyr | Ser | Ile | Lys |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Tyr | Tyr | Leu | Lys | Ala | Gly | Ala | Asp | Arg | Asp | Lys | Leu | Val | Leu | Gly |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ile | Pro | Thr | Tyr | Gly | Arg | Ser | Tyr | Thr | Leu | Ile | Asn | Glu | Glu | Ser | 305 | 310 | 315 |
| Thr | Glu | Leu | Gly | Ala | Pro | Ala | Glu | Gly | Pro | Gly | Glu | Gln | Gly | Asp | 320 | 325 | 330 |
| Ala | Thr | Arg | Glu | Lys | Gly | Tyr | Leu | Ala | Tyr | Tyr | Glu | Ile | Cys | Gln | 335 | 340 | 345 |
| Thr | Leu | Lys | Asp | Asp | Pro | Glu | Trp | Thr | Val | Val | Gln | Pro | Asn | Ala | 350 | 355 | 360 |
| Asn | Val | Met | Gly | Pro | Tyr | Ala | Tyr | Arg | Arg | Asn | Gln | Trp | Val | Gly | 365 | 370 | 375 |
| Tyr | Asp | Asp | Glu | Ala | Ile | Val | Arg | Lys | Lys | Ala | Glu | Tyr | Val | Val | 380 | 385 | 390 |
| Ala | Gln | Gly | Leu | Gly | Gly | Ile | Met | Phe | Trp | Ala | Ile | Asp | Asn | Asp | 395 | 400 | 405 |
| Asp | Phe | Arg | Gly | Thr | Cys | Asn | Gly | Lys | Pro | Tyr | Pro | Leu | Ile | Glu | 410 | 415 | 420 |
| Ala | Ala | Lys | Glu | Ala | Met | Val | Glu | Ala | Leu | Gly | Leu | Gly | Ile | Asn | 425 | 430 | 435 |
| Glu | Val | Ala | Lys | Pro | Ser | Gly | Pro | Gln | Lys | Pro | Ser | Arg | Ser | Arg | 440 | 445 | 450 |
| Ser | Arg | Asp | Asn | Ala | Ser | Asn | Arg | Asn | Arg | Leu | Asn | Gly | Lys | Thr | 455 | 460 | 465 |
| Glu | Ala | Pro | Leu | Ser | Ser | Arg | Arg | Pro | Ser | Ala | Thr | Arg | Arg | Pro | 470 | 475 | 480 |
| Ala | Val | Ser | Ser | Thr | Gln | Ala | Pro | Pro | Pro | Ser | Thr | Thr | Phe | Lys | 485 | 490 | 495 |
| Leu | Thr | Glu | Ala | Glu | Gly | Ser | Ser | Leu | Tyr | Ile | Gly | Gly | Arg | Ala | 500 | 505 | 510 |
| Ser | Thr | Thr | Pro | Pro | Pro | Pro | Thr | Thr | Pro | Asp | Pro | Gly | Ser | Asp | 515 | 520 | 525 |
| Phe | Lys | Cys | Glu | Glu | Glu | Gly | Phe | Phe | Gln | His | Pro | Arg | Asp | Cys | 530 | 535 | 540 |
| Lys | Lys | Tyr | Tyr | Trp | Cys | Leu | Asp | Ser | Gly | Pro | Ser | Gly | Leu | Gly | 545 | 550 | 555 |
| Ile | Val | Ala | His | Met | Phe | Thr | Cys | Pro | Ser | Gly | Leu | Tyr | Phe | Asn | 560 | 565 | 570 |
| Pro | Ala | Ala | Asp | Ser | Cys | Asp | Phe | Ala | Arg | Asn | Val | Pro | Cys | Lys | 575 | 580 | 585 |
| Thr | Lys | Lys | Ser | Thr | Thr | Ala | Ala | Pro | Val | Thr | Ser | Thr | Thr | Pro | 590 | 595 | 600 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Thr | Thr | Thr | Val | Arg | Ser | Asn | Arg | Val | Thr | Ala | Ala | Pro | Thr | 605 | 610 | 615 |
| Ser | Arg | Pro | Val | Tyr | Pro | Arg | Thr | Thr | Thr | Thr | Thr | Ser | Thr | Thr | 620 | 625 | 630 |
| Thr | Thr | Thr | Thr | Thr | Thr | Pro | Ser | Thr | Val | Asp | Glu | Asp | Leu | Glu | 635 | 640 | 645 |
| Tyr | Glu | Glu | Asp | Thr | Asp | Glu | Leu | Ser | Pro | Ser | Lys | Ser | Thr | Asp | 650 | 655 | 660 |
| Ala | Glu | Glu | Asp | Pro | Gln | Val | Ile | Lys | Glu | Leu | Ile | Asp | Leu | Ile | 665 | 670 | 675 |
| Arg | Lys | Val | Gly | Gly | Val | Glu | Gln | Leu | Glu | Lys | His | Leu | Leu | Arg | 680 | 685 | 690 |
| Asn | Lys | Asp | Gly | Ser | Ile | Thr | Leu | Lys | Glu | Asn | Ser | Ala | Thr | Gly | 695 | 700 | 705 |
| Ala | Ala | Thr | Thr | Pro | Ser | Thr | Ile | Ser | Lys | Ser | Leu | Tyr | Asp | Arg | 710 | 715 | 720 |
| Val | Leu | Ser | Arg | Pro | Gly | Thr | Leu | Asn | Ser | Phe | Ser | Arg | Asn | Arg | 725 | 730 | 735 |
| Phe | Lys | Ile | Ser | Glu | Ala | Ser | Glu | Thr | Ser | Thr | Glu | Pro | Thr | Thr | 740 | 745 | 750 |
| Ser | Ser | Ser | Ser | Ser | Arg | Gly | Ser | Ser | Thr | Leu | Thr | Ser | Asn | Thr | 755 | 760 | 765 |
| Asn | Ser | Lys | Tyr | Ser | Ser | Val | Leu | Arg | Gly | Asn | Ser | Arg | Gln | Gly | 770 | 775 | 780 |
| Pro | Gln | Asn | Glu | Gly | Ile | Glu | Lys | Leu | Ala | Glu | Phe | Asp | Gly | Phe | 785 | 790 | 795 |
| Leu | Lys | Glu | Arg | Lys | Gln | Tyr | Val | Thr | Ile | Asn | Arg | His | Arg | Ser | 800 | 805 | 810 |
| Ala | Ser | Gln | Gly | Asp | Glu | Glu | Glu | His | Ala | Asp | Gln | Gln | Glu | Glu | 815 | 820 | 825 |
| Glu | Glu | Asn | Leu | Ala | Glu | Val | Glu | Thr | Thr | Thr | Arg | Arg | Pro | Leu | 830 | 835 | 840 |
| Ser | Ser | Ile | Thr | Pro | Ser | Tyr | Thr | Ser | Leu | Arg | Arg | Ser | Arg | Pro | 845 | 850 | 855 |
| Thr | Thr | Val | Ala | Pro | Pro | Ala | Glu | Glu | Ser | His | Glu | Glu | Ala | Glu | 860 | 865 | 870 |
| Gln | Gln | Thr | Gln | Thr | Gln | Val | Lys | Ser | Tyr | Ala | Thr | Leu | Ser | Arg | 875 | 880 | 885 |
| Thr | Arg | Gly | Arg | Thr | Thr | Ser | Ser | Pro | Glu | Val | Thr | Glu | Ala | Ala | 890 | 895 | 900 |
| Pro | Ser | Ser | Thr | Thr | Asn | Arg | Tyr | Lys | Tyr | Phe | Glu | Arg | Thr | Arg |     |     |     |

| 905 |     |     |     |      | 910 |     |     |     |      | 915 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Pro | Thr | Lys | Ser | Ala  | Thr | Ala | Glu | Asp | Ser  | Glu | Asp | Pro | Thr | Glu  |
|     |     |     |     | 920  |     |     |     |     | 925  |     |     |     |     | 930  |
| Asp | Glu | Glu | Glu | Glu  | Tyr | Glu | Asp | Glu | Gln  | Lys | Asp | Ile | Val | Thr  |
|     |     |     |     | 935  |     |     |     |     | 940  |     |     |     |     | 945  |
| Val | Gln | Ser | Lys | Gln  | Ser | Thr | Asn | Thr | Arg  | Lys | Tyr | Ala | Ser | Ile  |
|     |     |     |     | 950  |     |     |     |     | 955  |     |     |     |     | 960  |
| Gly | Arg | Arg | Thr | Thr  | Thr | Thr | Thr | Thr | Ala  | Thr | Pro | Glu | Thr | Thr  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Thr | Thr | Thr | Thr | Thr  | Thr | Thr | Ala | Gly | Thr  | Glu | Thr | Ala | Lys | Ala  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Ser | Thr | Thr | Thr | Asn  | Asn | Asn | Asn | Asn | Asn  | Asn | Ser | His | Tyr | Asn  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Ser | Ser | Asn | Asn | Asn  | Asn | Asn | Val | Lys | Leu  | Asn | Asn | Gln | Leu | Pro  |
|     |     |     |     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |
| Thr | Glu | Glu | Asn | Ile  | Thr | Thr | Thr | Pro | Ser  | Thr | Thr | Ala | Gln | Ser  |
|     |     |     |     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |
| Glu | Thr | Thr | Thr | Thr  | Thr | Asn | Glu | Thr | Thr  | Glu | Pro | Asn | Glu | Ser  |
|     |     |     |     | 1040 |     |     |     |     | 1045 |     |     |     |     | 1050 |
| Thr | Ser | Thr | Thr | Thr  | Thr | Ser | Ile | Thr | Asn  | Asn | Leu | His | Thr | Thr  |
|     |     |     |     | 1055 |     |     |     |     | 1060 |     |     |     |     | 1065 |
| Thr | Thr | Thr | Pro | Thr  | Pro | Ile | Val | Ala | Ser  | Thr | Val | Pro | Thr | Thr  |
|     |     |     |     | 1070 |     |     |     |     | 1075 |     |     |     |     | 1080 |
| Thr | Ala | Asn | Gly | Ile  | Ser | Ser | Asp | Ser | Leu  | Leu | Ala | Thr | Glu | Leu  |
|     |     |     |     | 1085 |     |     |     |     | 1090 |     |     |     |     | 1095 |
| Ser | Glu | Ala | Ser | Pro  | Thr | His | Leu | Ser | Pro  | Ser | Pro | Asp | Ser | Glu  |
|     |     |     |     | 1100 |     |     |     |     | 1105 |     |     |     |     | 1110 |
| Thr | Ser | Thr | Pro | Thr  | Thr | Thr | Ser | Thr | Thr  | Thr | Thr | Glu | Gln | Pro  |
|     |     |     |     | 1115 |     |     |     |     | 1120 |     |     |     |     | 1125 |
| Glu | Leu | Asp | Thr | Thr  | Thr | Thr | Thr | Pro | Lys  | Thr | Thr | Thr | Thr | Thr  |
|     |     |     |     | 1130 |     |     |     |     | 1135 |     |     |     |     | 1140 |
| Thr | Thr | Gly | Asn | Asn  | Glu | Leu | Asn | Asp | Val  | Asn | Asn | Val | Asp | Glu  |
|     |     |     |     | 1145 |     |     |     |     | 1150 |     |     |     |     | 1155 |
| Asp | Ser | Glu | Val | Thr  | Lys | Thr | Lys | Thr | Gln  | Tyr | Lys | Tyr | Ala | Thr  |
|     |     |     |     | 1160 |     |     |     |     | 1165 |     |     |     |     | 1170 |
| Thr | Asn | Arg | Arg | Arg  | Ile | Thr | Thr | Thr | Thr  | Thr | Thr | Ala | Thr | Lys  |
|     |     |     |     | 1175 |     |     |     |     | 1180 |     |     |     |     | 1185 |
| Asn | Ser | Asn | Asn | Asn  | Asn | Asn | Ala | Glu | Ala  | Ala | Asn | Asp | Ala | Ser  |
|     |     |     |     | 1190 |     |     |     |     | 1195 |     |     |     |     | 1200 |
| Pro | Thr | Thr | Asn | Gly  | Leu | Ser | Ser | Leu | Asn  | Ser | Ile | Arg | Thr | Asn  |
|     |     |     |     | 1205 |     |     |     |     | 1210 |     |     |     |     | 1215 |

|                     |                     |                     |  |
|---------------------|---------------------|---------------------|--|
| Pro Gly Arg Arg Gln | Pro Gln Pro Glu Gln | Thr Gln Thr Thr Thr |  |
| 1220                | 1225                | 1230                |  |
| Ser Glu Pro Asn Leu | Ser Ser Pro Arg Pro | Phe Gly Tyr Pro Arg |  |
| 1235                | 1240                | 1245                |  |
| Arg Arg Thr Arg Pro | Thr Val Ser Thr Thr | Thr Thr Thr Ile Ser |  |
| 1250                | 1255                | 1260                |  |
| Gln Thr Asp Asn Asp | Asn Asn Thr Asp Asn | Asn Asp Asn Glu Thr |  |
| 1265                | 1270                | 1275                |  |
| Asp Ala Val Ala Gln | Val Val Lys Lys Thr | Arg Leu Ser Pro Gly |  |
| 1280                | 1285                | 1290                |  |
| Asp Arg Pro Lys Val | Ser Ala Ser Leu Pro | Thr Ala Thr Ala Ile |  |
| 1295                | 1300                | 1305                |  |
| Asn Thr Arg Thr Asn | Thr Ser Ser Leu His | His Gln Glu Ser Gln |  |
| 1310                | 1315                | 1320                |  |
| Val Glu Val Ala Gly | Asn Gly Gly Asn Asp | Ser Leu Arg His Asp |  |
| 1325                | 1330                | 1335                |  |
| Val Val Ser Ser Ser | Leu Ser Gln Ser Gln | Ser Asn Lys Ile Asp |  |
| 1340                | 1345                | 1350                |  |
| Thr Asp Asp Leu Ser | Thr Thr Gln Gln His | Thr Lys Tyr Thr Trp |  |
| 1355                | 1360                | 1365                |  |
| Arg Ala Val Arg Arg | Pro Ala Ser Gln Arg | Thr Val Val Pro Asn |  |
| 1370                | 1375                | 1380                |  |
| Ser Leu Ala Gly Asp | Asp Lys Asp Ser Arg | Arg Phe Ala Gly Lys |  |
| 1385                | 1390                | 1395                |  |
| Gln Leu Asn Thr Glu | Ser Ile Val Asp Asp | Glu Leu Gln Thr Thr |  |
| 1400                | 1405                | 1410                |  |
| Thr Lys Phe Arg Ser | Arg Arg Leu Asn Ser | Ala Glu Asp Glu Ser |  |
| 1415                | 1420                | 1425                |  |
| Glu Val Ala Leu Glu | Val Ala Thr Ala Thr | Pro Thr His Gly Ser |  |
| 1430                | 1435                | 1440                |  |
| Arg Ser Tyr Gln Ser | Ile Gln Arg Ser Ala | Ser Lys Ala Ser Leu |  |
| 1445                | 1450                | 1455                |  |
| Asp Asp Ser Gln Ile | His Tyr Lys Ala Ile | Ile Arg Asp Ser Glu |  |
| 1460                | 1465                | 1470                |  |
| Gly Gly Ala His Leu | Thr Ala Gly Arg Ser | Ser Ser Phe Val Arg |  |
| 1475                | 1480                | 1485                |  |
| Asn Phe Gly Asp Ala | Ala Lys Pro Thr Pro | Pro His Gln Pro Ile |  |
| 1490                | 1495                | 1500                |  |
| Ser Arg Gly Gly Gln | Ile Val Glu Ser Thr | Thr Glu Asp Glu Asn |  |
| 1505                | 1510                | 1515                |  |



| 1820  | 1825 | 1830 |
|---|------|------|
| Thr Thr Val Ala Pro Ser Ser Thr Thr Glu Glu Ile Ser Ser Ser<br>1835 | 1840 | 1845 |
| Ser Val Asp Asp Asp Ala Glu Ala Asn Ile Ile Thr Thr Arg Arg<br>1850 | 1855 | 1860 |
| Ser Leu Phe Thr Thr Pro Ala Pro Ser Ser Thr Glu Ala Thr Thr<br>1865 | 1870 | 1875 |
| Thr Ala Thr Ala Glu Asp Ser Glu Val Ser Ser Ser Thr Arg Arg<br>1880 | 1885 | 1890 |
| Ser Phe Phe Arg Thr Ser Thr Thr Thr Glu Gly Thr Thr Ser Thr<br>1895 | 1900 | 1905 |
| Thr Glu Glu Ala Lys Asp Ile Glu His Glu Ser Glu Thr Thr Ala<br>1910 | 1915 | 1920 |
| Ala Leu Pro Lys Arg Arg Val Ile Val Arg Gly Asn Phe Arg Pro<br>1925 | 1930 | 1935 |
| Arg Lys Glu Gly Asp Leu Ser Ser Leu Leu Ala Ala Asp Ala Asn<br>1940 | 1945 | 1950 |
| Lys Arg Val Arg Asn Asn His Ser Thr Thr Ser Thr Glu Thr Pro<br>1955 | 1960 | 1965 |
| Ala Asn Ser Gln Ser Thr Thr Ser Asn Glu Glu Asp Thr Val Ala<br>1970 | 1975 | 1980 |
| Gln Pro Pro Gln Ala Glu Val Lys Ala Thr Thr Gly Arg Val Ser<br>1985 | 1990 | 1995 |
| Leu Asn Ala Val Arg Asn Arg Thr Thr Thr Lys Thr Glu Ser Leu<br>2000 | 2005 | 2010 |
| Gly Asn Gly Ile Thr Arg Thr Arg Thr Thr Tyr Val Arg Thr Leu<br>2015 | 2020 | 2025 |
| Asp Ala Gly Gln Lys Ile Val Lys Arg Ile His Thr Lys Thr Ile<br>2030 | 2035 | 2040 |
| Glu Glu Lys Pro Ala Glu Tyr Glu Tyr Ile Ile Asp Glu Val Thr<br>2045 | 2050 | 2055 |
| His Pro Pro Ala Ala Ser Thr Thr Pro Arg Thr Val Thr Arg Asn<br>2060 | 2065 | 2070 |
| Arg Gly Ser Val Arg Phe Gln Ser Asn Asp Leu Ser Ser Leu Leu<br>2075 | 2080 | 2085 |
| Ala Leu Asp Phe Ala Ser Arg Ser Thr Arg Lys Lys Gln Ala Gln<br>2090 | 2095 | 2100 |
| Thr Glu Thr Thr Val Thr Lys Thr Arg Arg Arg Leu Leu Lys Lys<br>2105 | 2110 | 2115 |
| Pro Lys Glu Thr Ile Glu His Glu Glu Val Glu Glu Tyr Glu Tyr<br>2120 | 2125 | 2130 |

|   |      |      |      |
|---|------|------|------|
| Glu Ala Gly Gln Glu Ala Gly Asn Glu Val Glu Glu Ala Pro Arg | 2135 | 2140 | 2145 |
| Val Ser Thr Thr Ala Arg Thr Ile Ile Arg Arg Thr Arg Pro Thr | 2150 | 2155 | 2160 |
| Thr Ile Arg Thr Thr Thr Thr Glu Thr Pro Gln Asn Ile Glu Ala | 2165 | 2170 | 2175 |
| Ser Thr Arg Arg Ala Ser Phe Ala Phe Lys Arg Pro Ser Lys Val | 2180 | 2185 | 2190 |
| Ser Thr Thr Thr Glu Glu Pro Thr Thr Ser Ser Thr Glu Pro Thr | 2195 | 2200 | 2205 |
| Ile Ser Ala Glu Ala Thr Thr Arg Arg Val Leu Asn Phe Arg Arg | 2210 | 2215 | 2220 |
| Pro Val Ser Thr Thr Ser Thr Pro Ala Ser Asp Glu Ser Thr Glu | 2225 | 2230 | 2235 |
| Glu Ala Thr Ala Ala Pro Ile Glu Ala Thr Thr Arg Arg Val Leu | 2240 | 2245 | 2250 |
| Ala Phe Lys Arg Pro Val Ser Thr Thr Thr Thr Pro Ala Pro Val | 2255 | 2260 | 2265 |
| Asp Glu Glu Ser Thr Glu Glu Ser Thr Pro Thr Ser Ile Glu Gly | 2270 | 2275 | 2280 |
| Asn Thr Arg Arg Ile Leu Ala Tyr Arg Arg Pro Val Ser Thr Thr | 2285 | 2290 | 2295 |
| Thr Thr Thr Pro Val Pro Val Glu Asp Glu Ser Ser Thr Asp Gln | 2300 | 2305 | 2310 |
| Leu Ala Ala Ala Lys Gln Lys Phe Ile Asn Arg Leu Lys Ser Ser | 2315 | 2320 | 2325 |
| Thr Thr Thr Thr Thr Ser Ile Pro Glu Thr Thr Thr Thr Glu Glu | 2330 | 2335 | 2340 |
| Asp Leu Ser Asp Leu Lys Val Gln Leu Ser Asn Ala Ile Asn Arg | 2345 | 2350 | 2355 |
| Leu Gln Thr Glu Asn Lys Leu Glu Val Gln Thr Ile Thr Lys Gly | 2360 | 2365 | 2370 |
| Ser Glu Ala Ala Glu Asp Glu Gly Asp Asp Lys Leu Ser Leu Pro | 2375 | 2380 | 2385 |
| Ile Tyr His Arg Arg Lys Tyr Tyr Gln Tyr Val Lys Asp Ser Pro | 2390 | 2395 | 2400 |
| Ile Thr Tyr Ile Asp Lys Ser Pro Ala Pro Pro Asp Ile Glu Ser | 2405 | 2410 | 2415 |
| Val Thr Val Asn Ile Lys Gln Gln Ile His Asp Val Phe Asn Val | 2420 | 2425 | 2430 |





|                     |                     |                     |
|---------------------|---------------------|---------------------|
| 2735                | 2740                | 2745                |
| Thr Thr Thr Thr Thr | Pro Ala Ser Thr Thr | Ser Arg Arg Gln Leu |
| 2750                | 2755                | 2760                |
| Val Ile Arg Arg Arg | Phe Asn Gly Thr Ile | Thr Thr Thr Thr Thr |
| 2765                | 2770                | 2775                |
| Val Ala Pro Val Ala | Asp Glu Asn Leu Glu | Asn Glu Ile Asp Pro |
| 2780                | 2785                | 2790                |
| Ser Asp Thr Glu Ser | Ser Thr Pro Lys Ala | Ala Thr Thr Thr Ser |
| 2795                | 2800                | 2805                |
| Pro Arg Arg Gln Leu | Leu Ile Arg Arg Arg | Phe Asn Ala Thr Ser |
| 2810                | 2815                | 2820                |
| Ser Gly Ser Thr Thr | Thr Thr Thr Ala Asn | Pro Ser Ala Asp Asn |
| 2825                | 2830                | 2835                |
| Glu Ile Asp Gln Gly | Glu Thr Lys Arg Thr | Thr Arg Arg Pro Ile |
| 2840                | 2845                | 2850                |
| Leu Ser Arg Arg Arg | Phe Asn Ala Thr Ser | Ile Thr Ala Thr Thr |
| 2855                | 2860                | 2865                |
| Thr Gly Ser Thr Asn | Gly Asp Glu Ile Ser | Thr Arg Arg Pro Tyr |
| 2870                | 2875                | 2880                |
| Ala Ala Leu Asn Arg | Ser Arg Asn Arg Phe | Thr Thr Pro Gln Thr |
| 2885                | 2890                | 2895                |
| Thr Thr Thr Asp Gly | Gly Ala Asn Gly Asp | Asp Asp Asp Tyr Asp |
| 2900                | 2905                | 2910                |
| Gly Glu Glu Glu Glu | Gln Leu Ala Pro Pro | Arg Ala Val Phe Leu |
| 2915                | 2920                | 2925                |
| Gln Thr Asn Arg His | Arg Ala Leu Lys Pro | Thr Pro Glu Asp Glu |
| 2930                | 2935                | 2940                |
| Glu Glu Gly Ala Ala | Ala Val Pro Gly Arg | Arg Pro Leu Asn Phe |
| 2945                | 2950                | 2955                |
| Ala Ala Arg Arg Thr | Thr Ala Ala Pro Leu | Arg Val Ser Ser Ser |
| 2960                | 2965                | 2970                |
| Thr Arg Arg Asn Leu | Val Ala Ile Asn Arg | Asn Leu Tyr His Arg |
| 2975                | 2980                | 2985                |
| Pro Glu Glu Asp Asn | Glu Glu Glu Pro Glu | Glu Glu Tyr Asp Glu |
| 2990                | 2995                | 3000                |
| Asn Glu Asp Gly Asp | Asp Asp Gln Glu Glu | Ser Val Asp Pro Gln |
| 3005                | 3010                | 3015                |
| Val Thr Ser Thr Thr | Thr Arg Ser Arg Leu | Asn Gln Leu Leu Ala |
| 3020                | 3025                | 3030                |
| Asn Arg Gln Arg Gln | Pro Leu Arg Thr Thr | Thr Glu Lys Gln Thr |
| 3035                | 3040                | 3045                |

|   |      |      |      |
|---|------|------|------|
| Glu Thr Asp Ser Asn Asp Thr Glu Thr Asp Ser Asp Asn Gly Asp | 3050 | 3055 | 3060 |
| Glu Asn Asp Asp Asp Glu Asp Asn Asp Ser Ser Val Glu Val Ser | 3065 | 3070 | 3075 |
| Asn Ser Asn His Thr Leu Lys His Ser Thr Ile Phe Gly Val Gly | 3080 | 3085 | 3090 |
| Thr Thr Asn Phe Asn Asn Leu Thr Asn Arg Ser Thr Ala Leu Asn | 3095 | 3100 | 3105 |
| Val Ala Ser Gln Arg Ser Asn Ser Thr Val Ala Asn Tyr Ile Asn | 3110 | 3115 | 3120 |
| Arg Phe Lys Ser Asn Ser Tyr Thr Asn Lys Asn Lys Pro Val Thr | 3125 | 3130 | 3135 |
| Val Thr Ala Asn Ile Lys Ala Asp Ser Thr Asp Asp Lys Asp Asn | 3140 | 3145 | 3150 |
| Asp Asn Asp Glu Asp Asp Asp Asp Asp Asp Asn Asp Asp Asp Asn | 3155 | 3160 | 3165 |
| Tyr Ala Ser Leu Glu Asn Glu Gly Lys Glu Lys Thr Ser Gly Ala | 3170 | 3175 | 3180 |
| Gly Leu Asn Ala Leu Gly Asn Asp Val Asn Ser Thr Arg Arg Phe | 3185 | 3190 | 3195 |
| Gln Asn Arg Tyr Gln Leu Ser Arg Thr Arg Gly Ser Thr Thr Thr | 3200 | 3205 | 3210 |
| Asn Thr Asn Pro Thr Thr Thr Gln Gln Pro Gln Thr Thr Ser Thr | 3215 | 3220 | 3225 |
| Ala Arg Arg Leu Ala Phe Gly Gly Arg Gln Arg Ala Gln Val Thr | 3230 | 3235 | 3240 |
| Lys Leu Thr Leu Val Asp Glu Gln Thr Glu Glu Thr Glu Thr Lys | 3245 | 3250 | 3255 |
| Gly Asp Ser Arg Glu Glu Glu Lys Glu Glu Glu Glu Glu Asp     | 3260 | 3265 | 3270 |
| Ser Asn Ala Thr Thr Thr Thr Thr Thr Thr Thr Thr Ser Arg Pro | 3275 | 3280 | 3285 |
| Thr Pro Lys Arg Ile Arg Val Leu Lys Phe Arg Arg Pro Leu Asn | 3290 | 3295 | 3300 |
| Ser Asn Ser Asn Ser Thr Ile Asn Val Asp Ser Thr Thr Asn Ser | 3305 | 3310 | 3315 |
| Ala Thr Asp Thr Asn Pro Asp Thr Thr Thr Ala Thr Pro Thr Thr | 3320 | 3325 | 3330 |
| Ala Gly Gln Ser Thr Thr Ser Asn Ser Asn Asn Asn Asn Asn     | 3335 | 3340 | 3345 |



|   |      |      |
|---|------|------|
| 3650  | 3655 | 3660 |
| Lys Pro Lys Phe Asn Ser Pro Tyr Lys Pro Lys Asp Asn Arg Ala |      |      |
| 3665  | 3670 | 3675 |
| Pro Pro Gly Ser Arg Pro Thr Phe Gly Thr Thr Gly Ser Gly Ser |      |      |
| 3680  | 3685 | 3690 |
| Pro Pro Thr Ala Ser Gly Asn Val Pro Tyr Asn Pro Arg Asn Arg |      |      |
| 3695  | 3700 | 3705 |
| Pro Ser Asn Ser Ala Asn Gly Asn Ser Thr Pro Ser Asn Arg Phe |      |      |
| 3710  | 3715 | 3720 |
| Gly Thr Thr Lys Arg Pro Arg Val Val Asn Arg Pro Pro Gly Val |      |      |
| 3725  | 3730 | 3735 |
| Ala Ser Pro Asn Leu Thr Leu Lys Pro Val Ala Ser Asp Tyr Glu |      |      |
| 3740  | 3745 | 3750 |
| Arg Thr Thr Pro Leu Thr Pro Leu Lys Pro Ala Pro Phe Ile Pro |      |      |
| 3755  | 3760 | 3765 |
| Ser Asn Asn Arg Ser Tyr Glu Arg Lys Tyr Ser Gly Pro Ser Thr |      |      |
| 3770  | 3775 | 3780 |
| Glu Ala Ala Glu Thr Ala Ser Glu Asn Ser Leu Ile Glu Asp Leu |      |      |
| 3785  | 3790 | 3795 |
| Asn Ile Asp Ala Leu Asn Ala Arg Asn Lys Lys Ile Phe Asp Lys |      |      |
| 3800  | 3805 | 3810 |
| His Ser Lys Lys His Pro Ala Leu Lys Pro Lys Val Val Lys Val |      |      |
| 3815  | 3820 | 3825 |
| Glu Ser Glu Thr Gly Leu Glu Val Glu Ala Gly Thr Glu Val Ala |      |      |
| 3830  | 3835 | 3840 |
| Val Glu Asp Glu Thr Thr Glu Glu Gln Gln Gln Glu Gln Gly Phe |      |      |
| 3845  | 3850 | 3855 |
| Val Thr Thr Thr Pro Ser Thr Pro Pro Ser Pro Ala Pro Pro Ser |      |      |
| 3860  | 3865 | 3870 |
| Thr Gln Ser Asp Thr Ala Thr Thr Thr Asp Thr Pro Pro Glu Thr |      |      |
| 3875  | 3880 | 3885 |
| Glu Thr Glu Thr Glu Thr Glu Thr Glu Thr Glu Thr Glu Thr Glu |      |      |
| 3890  | 3895 | 3900 |
| Asn Val Thr Glu Ile Glu Thr Ala Thr Asn Ala Asn Glu Ala Thr |      |      |
| 3905  | 3910 | 3915 |
| Ser Ile Asn Ser Gln Asp Gln Thr Ile Ser Ser Thr Thr Gln Ala |      |      |
| 3920  | 3925 | 3930 |
| Pro Pro Pro Ala Thr Thr Leu Leu His Val Phe Thr Leu Leu Glu |      |      |
| 3935  | 3940 | 3945 |
| Gly Glu Gly Gln Glu Glu Glu Pro Thr Thr Arg Lys Pro Thr Val |      |      |
| 3950  | 3955 | 3960 |

|     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |  |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|--|
| Arg | Leu | Tyr | Pro | Thr  | Ile | Gln | Thr | Glu | Val  | Val | Pro | Lys | His | Lys  |  |
|     |     |     |     | 3965 |     |     |     |     | 3970 |     |     |     |     | 3975 |  |
| Leu | Ile | Glu | Ile | Asn  | Arg | Ile | Val | Glu | Ile  | Asn | Ser | Lys | Gln | Ala  |  |
|     |     |     |     | 3980 |     |     |     |     | 3985 |     |     |     |     | 3990 |  |
| Lys | Ala | Ala | Gln | Arg  | Lys | Ser | Lys | Ala | Asn  | His | Asp | Phe | Ser | Thr  |  |
|     |     |     |     | 3995 |     |     |     |     | 4000 |     |     |     |     | 4005 |  |
| Leu | Met | Val | Glu | Ser  | Leu | Pro | His | Val | Glu  | Gln | Leu | Gly | Glu | Ile  |  |
|     |     |     |     | 4010 |     |     |     |     | 4015 |     |     |     |     | 4020 |  |
| Ser | Val | Val | Lys | Tyr  | Val | His | Leu | Val | Asp  | Gly | Ser | Asp | Ile | Gln  |  |
|     |     |     |     | 4025 |     |     |     |     | 4030 |     |     |     |     | 4035 |  |
| Ile | Asn | Asp | Gly | His  | Ser | Thr | Val | Ala | Asp  | Tyr | Thr | Pro | Thr | Glu  |  |
|     |     |     |     | 4040 |     |     |     |     | 4045 |     |     |     |     | 4050 |  |
| Pro | Thr | Ser | Ala | Ala  | Glu | Arg | Pro | Val | Ser  | Leu | Pro | Val | Arg | Asn  |  |
|     |     |     |     | 4055 |     |     |     |     | 4060 |     |     |     |     | 4065 |  |
| Ser | Leu | Pro | Glu | Thr  | Glu | Gly | Ala | Asp | Thr  | Asp | Arg | Ser | Gly | Lys  |  |
|     |     |     |     | 4070 |     |     |     |     | 4075 |     |     |     |     | 4080 |  |
| Ser | Leu | Val | Pro | Glu  | Val | Leu | Thr | Ala | Ala  | Leu | Glu | Thr | Ser | Thr  |  |
|     |     |     |     | 4085 |     |     |     |     | 4090 |     |     |     |     | 4095 |  |
| Ile | Ser | Leu | Glu | Gly  | Leu | Phe | Asp | Ser | Ala  | Arg | Lys | Gly | Lys | Gln  |  |
|     |     |     |     | 4100 |     |     |     |     | 4105 |     |     |     |     | 4110 |  |
| Leu | Ser | Ser | Asn | Thr  | Ile | Ile | Gly | Glu | Thr  | Glu | Glu | Ser | Thr | Thr  |  |
|     |     |     |     | 4115 |     |     |     |     | 4120 |     |     |     |     | 4125 |  |
| Ile | Gly | Ser | Ser | Ser  | Ser | Leu | Ala | Ser | Glu  | Thr | Gly | Glu | Thr | Thr  |  |
|     |     |     |     | 4130 |     |     |     |     | 4135 |     |     |     |     | 4140 |  |
| Thr | Pro | Ala | Pro | Thr  | Tyr | Val | Arg | Pro | Ile  | Val | Pro | Leu | Leu | Arg  |  |
|     |     |     |     | 4145 |     |     |     |     | 4150 |     |     |     |     | 4155 |  |
| Pro | Glu | Ser | Asn | Glu  | Ser | Ser | Pro | Leu | Val  | Ile | Ser | Ile | Ala | Asn  |  |
|     |     |     |     | 4160 |     |     |     |     | 4165 |     |     |     |     | 4170 |  |
| Leu | Asp | Gln | Val | Ile  | Leu | Ser | Lys | Val | Gln  | Lys | Ser | Leu | Ala | Glu  |  |
|     |     |     |     | 4175 |     |     |     |     | 4180 |     |     |     |     | 4185 |  |
| Asn | Ser | Gln | Thr | Thr  | Val | Ala | Pro | Glu | Ala  | Ala | Ser | Asp | Ser | Asn  |  |
|     |     |     |     | 4190 |     |     |     |     | 4195 |     |     |     |     | 4200 |  |
| Ser | Ala | Phe | Ser | Val  | Arg | Gln | Pro | Leu | Val  | Val | Gln | Ala | Pro | Ile  |  |
|     |     |     |     | 4205 |     |     |     |     | 4210 |     |     |     |     | 4215 |  |
| Ser | Asn | Gly | Ala | Gln  | Glu | Ile | Asp | Gln | Asp  | Thr | Leu | Asn | Thr | Gln  |  |
|     |     |     |     | 4220 |     |     |     |     | 4225 |     |     |     |     | 4230 |  |
| Asp | Gln | Thr | Ile | Asn  | Gly | Ala | Ile | Ser | Val  | Lys | Thr | Asn | Pro | Ile  |  |
|     |     |     |     | 4235 |     |     |     |     | 4240 |     |     |     |     | 4245 |  |
| Ile | Gln | Thr | Thr | Thr  | Asn | Arg | Pro | Asn | Asp  | Asp | Gln | Val | Ala | Glu  |  |
|     |     |     |     | 4250 |     |     |     |     | 4255 |     |     |     |     | 4260 |  |

|   |      |      |      |
|---|------|------|------|
| Glu Thr Thr Ile Phe Ser Ile Glu Thr Ala Thr Glu Pro Glu Leu | 4265 | 4270 | 4275 |
| Asn Thr Gln Thr Thr Ile Pro Lys Thr Glu Ala Asn Ser Glu Thr | 4280 | 4285 | 4290 |
| Val Thr Ala Met Pro Ile Gly Ala Val Ile Met Gly Gln Phe Gly | 4295 | 4300 | 4305 |
| Leu Asn Thr Gln Ser Thr Thr Ala Val Asp Asn Asp Asn Gln Leu | 4310 | 4315 | 4320 |
| Asn Ala Gln Thr Thr Ser Thr Ile Ser Ser Gly Ala Val Ser Ser | 4325 | 4330 | 4335 |
| Val Ala Ile Gly Gly Asn Thr Gln Thr Ala Asn Ala Asp Asn Ala | 4340 | 4345 | 4350 |
| Arg Gln Glu Asn Thr Gln Ser Thr Gly Thr Ile Thr Ser Glu Ile | 4355 | 4360 | 4365 |
| Ser Ser Gly Ala Ile Ser Ser Asp Asn His Asn His Ile Gly Thr | 4370 | 4375 | 4380 |
| Gln Thr Thr Ala Thr Ile Asp Ser Ser Ser Glu Thr Thr Pro Thr | 4385 | 4390 | 4395 |
| Gln Ile Ser Thr Thr Ile Ser Ser Gly Ala Ile Ser Gly His Ile | 4400 | 4405 | 4410 |
| Asp Gly Ser Ile Asn Leu Asn Thr Gln Thr Asn Thr Thr Ile Ser | 4415 | 4420 | 4425 |
| Thr Asn Asn Thr Thr Thr Ser Thr Thr Asp Val Gly Ser Lys Val | 4430 | 4435 | 4440 |
| Ser Glu Ala Val Ser Phe Ser Ser Glu Thr His Val Val His Arg | 4445 | 4450 | 4455 |
| Lys Lys Met Gly Arg Lys Gly Arg Gly Arg Arg Leu Arg Asn Arg | 4460 | 4465 | 4470 |
| Lys Thr Thr Thr Thr Thr Thr Thr Thr Glu Thr Pro Thr Thr Thr | 4475 | 4480 | 4485 |
| Glu Ala Thr Phe Asp Asp Thr Thr Thr Val Val Pro Glu         | 4490 | 4495 |      |

<210> 69  
 <211> 782  
 <212> DNA  
 <213> Homo sapien

<400> 69  
 aggggcctta gcgtgccgca tcgccgagat ccagcgccca gagagacacc 50  
 agagaaccca ccatggcccc ctttgagccc ctggcttctg gcatcctgtt 100  
 gttgctgtgg ctgatagccc ccagcagggc ctgcacctgt gtcccacccc 150  
 acccacagac ggccttctgc aattccgacc tcgtcatcag ggccaagtgc 200

gtggggacac cagaagtcaa ccagaccacc ttataccagc gttatgagat 250  
 caagatgacc aagatgtata aaggggtcca agccttaggg gatgccgctg 300  
 acatccggtt cgtctacacc cccgccatgg agagtgtctg cggatacttc 350  
 cacaggtccc acaaccgcag cgaggagttt ctcatgtctg gaaaactgca 400  
 ggatggactc ttgcacatca ctacctgcag ttctgtggct ccctggaaca 450  
 gcctgagctt agctcagcgc cggggcttca ccaagaccta cactgttggc 500  
 tgtgaggaat gcacagtgtt tccctgttta tccatcccct gcaaactgca 550  
 gagtggcact cattgcttgt ggacggacca gtcctccaa ggctctgaaa 600  
 agggcttcca gtcccgtcac cttgcctgcc tgcctcggga gccagggctg 650  
 tgcacctggc agtccctgcg gtcccagata gcctgaatcc tgcccggagt 700  
 ggaactgaag cctgcacagt gtccaccctg ttcccactcc catctttctt 750  
 ccggacaatg aaataaagag ttaccaccca gc 782

<210> 70  
 <211> 207  
 <212> PRT  
 <213> Homo sapien

<400> 70  
 Met Ala Pro Phe Glu Pro Leu Ala Ser Gly Ile Leu Leu Leu Leu  
 1 5 10 15  
 Trp Leu Ile Ala Pro Ser Arg Ala Cys Thr Cys Val Pro Pro His  
 20 25 30  
 Pro Gln Thr Ala Phe Cys Asn Ser Asp Leu Val Ile Arg Ala Lys  
 35 40 45  
 Phe Val Gly Thr Pro Glu Val Asn Gln Thr Thr Leu Tyr Gln Arg  
 50 55 60  
 Tyr Glu Ile Lys Met Thr Lys Met Tyr Lys Gly Phe Gln Ala Leu  
 65 70 75  
 Gly Asp Ala Ala Asp Ile Arg Phe Val Tyr Thr Pro Ala Met Glu  
 80 85 90  
 Ser Val Cys Gly Tyr Phe His Arg Ser His Asn Arg Ser Glu Glu  
 95 100 105  
 Phe Leu Ile Ala Gly Lys Leu Gln Asp Gly Leu Leu His Ile Thr  
 110 115 120  
 Thr Cys Ser Phe Val Ala Pro Trp Asn Ser Leu Ser Leu Ala Gln  
 125 130 135  
 Arg Arg Gly Phe Thr Lys Thr Tyr Thr Val Gly Cys Glu Glu Cys  
 140 145 150



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Val | Phe | Pro | Cys | Leu | Ser | Ile | Pro | Cys | Lys | Leu | Gln | Ser | Gly |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Thr | His | Cys | Leu | Trp | Thr | Asp | Gln | Leu | Leu | Gln | Gly | Ser | Glu | Lys |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Gly | Phe | Gln | Ser | Arg | His | Leu | Ala | Cys | Leu | Pro | Arg | Glu | Pro | Gly |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Leu | Cys | Thr | Trp | Gln | Ser | Leu | Arg | Ser | Gln | Ile | Ala |     |     |     |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     |     |

<210> 71  
 <211> 481  
 <212> DNA  
 <213> Homo sapien

<400> 71  
 ccactgcacg gtaggggggc ctgtaggagg ctgggtggcag ggttggattg 50  
 tgggccctag gcttctgggc gggatgatga cattgagatt ctggcccctg 100  
 tatccacagg tgatggagac ctgccagatg tccaggagcc cccgagagcg 150  
 gctgttgctg cttttgctgc tgctactgct tgtgccctgg ggcactggcc 200  
 ctgcctcagg tgttgccctg cccctcgctg gtgtgttcag cctccgcgcc 250  
 ccgggtcgtg cctgggcggg cttgggtage cccctgtctc ggcgcagcct 300  
 ggcgctagct gacgacgcg cctttcggga gcgcgcgcgc ctgctggccg 350  
 ccctggagcg ccgccgctgg ctggactctt acatgcagaa gctgttgcta 400  
 ctggacgcgc cctgagccta ataaagagcc tgtcgactg cgactgcgcc 450  
 tctttgctgc gccactctct tgtgggtgtg t 481

<210> 72  
 <211> 100  
 <212> PRT  
 <213> Homo sapien

<400> 72  
 Met Glu Thr Cys Gln Met Ser Arg Ser Pro Arg Glu Arg Leu Leu  
 1 5 10 15  
 Leu Leu Leu Leu Leu Leu Leu Leu Val Pro Trp Gly Thr Gly Pro  
 20 25 30  
 Ala Ser Gly Val Ala Leu Pro Leu Ala Gly Val Phe Ser Leu Arg  
 35 40 45  
 Ala Pro Gly Arg Ala Trp Ala Gly Leu Gly Ser Pro Leu Ser Arg  
 50 55 60  
 Arg Ser Leu Ala Leu Ala Asp Asp Ala Ala Phe Arg Glu Arg Ala  
 65 70 75  
 Arg Leu Leu Ala Ala Leu Glu Arg Arg Arg Trp Leu Asp Ser Tyr  
 80 85 90

Met Gln Lys Leu Leu Leu Leu Asp Ala Pro  
95 100

<210> 73  
<211> 2974  
<212> DNA  
<213> Homo sapien

<400> 73  
ctcagggcag agggaggaag gacagcagac cagacagtca cagcagcctt 50  
gacaaaacgt tcctggaact caagctcttc tccacagagg aggacagagc 100  
agacagcaga gaccatggag tctccctcgg cccctcccca cagatgggtgc 150  
atcccctggc agaggctcct gctcacagcc tcacttctaa ccttctggaa 200  
cccgcccacc actgccaagc tcactattga atccacgccg ttcaatgtcg 250  
cagaggggaa ggaggtgctt ctacttgccc acaatctgcc ccagcatctt 300  
tttggtctaca gctggtacaa aggtgaaaga gtggatggca accgtcaaata 350  
tataggatat gtaataggaa ctcaacaagc taccacaggc cccgcataca 400  
gtggtcgaga gataatatac cccaatgcat cctgtctgat ccagaacatc 450  
atccagaatg acacaggatt ctacacccta cagctcataa agtcagatct 500  
tgtgaatgaa gaagcaactg gccagttccg ggtatacccg gagctgcca 550  
agccctccat ctccagcaac aactccaaac ccgtggagga caaggatgct 600  
gtggccttca cctgtgaacc tgagactcag gacgcaacct acctgtggtg 650  
ggtaaacaat cagagcctcc cggtcagtc caggctgcag ctgtccaatg 700  
gcaacaggac cctcactcta ttcaatgtca caagaaatga cacagcaagc 750  
tacaaatgtg aaaccacaga cccagtgagt gccaggcgca gtgattcagt 800  
catcctgaat gtcctctatg gcccggatgc cccaccatt tcccctctaa 850  
acacatctta cagatcaggg gaaaatctga acctctcctg ccacgcagcc 900  
tctaaccac ctgcacagta ctcttggttt gtcaatggga cttccagca 950  
atccacccaa gagctcttta tcccacacat cactgtgaat aatagtggat 1000  
cctatacgtg ccaagcccat aactcagaca ctggcctcaa taggaccaca 1050  
gtcacgacga tcacagtcta tgcagagcca ccaaaccct tcataccag 1100  
caacaactcc aaccccggtg aggatgagga tgctgtagcc ttaacctgtg 1150  
aacctgagat tcagaacaca acctacctgt ggtgggtaaa taatcagagc 1200  
ctcccggtca gtcccaggct gcagctgtcc aatgacaaca ggacctcac 1250  
tctactcagt gtcacaagga atgatgtagg acctatgag tgtggaatcc 1300

agaacgaatt aagtgttgac cacagcgacc cagtcacccct gaatgtcctc 1350  
 tatggcccag acgaccccac catttccccc tcatacacct attaccgtcc 1400  
 aggggtgaac ctcagcctct cctgccatgc agcctctaac ccacctgcac 1450  
 agtattcttg gctgattgat gggaaacatcc agcaacacac acaagagctc 1500  
 tttatctcca acatcactga gaagaacagc ggactctata cctgccaggc 1550  
 caataactca gccagtggcc acagcaggac tacagtcaag acaatcacag 1600  
 tctctgcgga gctgcccag cctccatct ccagcaaca ctccaaaccc 1650  
 gtggaggaca aggatgctgt ggccttcacc tgtgaacctg aggctcagaa 1700  
 cacaacctac ctgtggtggg taaatggcga gagcctcca gtcagtcca 1750  
 ggctgcagct gtccaatggc aacaggaccc tactctatt caatgtcaca 1800  
 agaaatgacg caagagccta tgtatgtgga atccagaact cagtgagtgc 1850  
 aaaccgcagt gaccagtc cctggatgt cctctatggg ccggacaccc 1900  
 ccatcatttc cccccagac tcgtcttacc tttcgggagc gaacctcaac 1950  
 ctctcctgcc actcggcctc taacccatcc ccgcagtatt cttggcgtat 2000  
 caatgggata ccgcagcaac acacacaagt tctctttatc gccaaaatca 2050  
 cgccaaataa taacgggacc tatgcctgtt ttgtctctaa cttggctact 2100  
 ggccgcaata attccatagt caagagcatc acagtctctg catctggaac 2150  
 ttctcctggt ctctcagctg gggccactgt cggcatcatg attggagtgc 2200  
 tggttggggt tgctctgata tagcagccct ggtgtagttt cttcatttca 2250  
 ggaagactga cagttgtttt gcttcttct taaagcattt gcaacagcta 2300  
 cagtctaaaa ttgcttcttt accaaggata ttacagaaa agactctgac 2350  
 cagagatcga gaccatccta gccaacatcg tgaaaccca tctctactaa 2400  
 aaatacaaaa atgagctggg cttggtggcg cgcacctgta gtcccagtta 2450  
 ctccggaggc tgaggcagga gaatcgcttg aaccgggag gtggagattg 2500  
 cagtgagccc agatcgacc actgcactcc agtctggcaa cagagcaaga 2550  
 ctccatctca aaaagaaaag aaaagaagac tctgacctgt actcttgaat 2600  
 acaagtttct gataccactg cactgtctga gaatttcaa aactttaatg 2650  
 aactaactga cagcttcatg aaactgtcca ccaagatcaa gcagagaaaa 2700  
 taattaattt catgggacta aatgaactaa tgaggattgc tgattcttta 2750  
 aatgtcttgt ttcccagatt tcaggaaact ttttttcttt taagctatcc 2800

actcttacag caatttgata aaatatactt ttgtgaacaa aaattgagac 2850  
 atttacattt tctccctatg tggtcgctcc agacttggga aactattcat 2900  
 gaatatttat attgtatggt aatatagtta ttgcacaagt tcaataaaaa 2950  
 tctgctcttt gtataacaga aaaa 2974

<210> 74  
 <211> 702  
 <212> PRT  
 <213> Homo sapien

<400> 74  
 Met Glu Ser Pro Ser Ala Pro Pro His Arg Trp Cys Ile Pro Trp  
 1 5 10 15  
 Gln Arg Leu Leu Leu Thr Ala Ser Leu Leu Thr Phe Trp Asn Pro  
 20 25 30  
 Pro Thr Thr Ala Lys Leu Thr Ile Glu Ser Thr Pro Phe Asn Val  
 35 40 45  
 Ala Glu Gly Lys Glu Val Leu Leu Leu Val His Asn Leu Pro Gln  
 50 55 60  
 His Leu Phe Gly Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly  
 65 70 75  
 Asn Arg Gln Ile Ile Gly Tyr Val Ile Gly Thr Gln Gln Ala Thr  
 80 85 90  
 Pro Gly Pro Ala Tyr Ser Gly Arg Glu Ile Ile Tyr Pro Asn Ala  
 95 100 105  
 Ser Leu Leu Ile Gln Asn Ile Ile Gln Asn Asp Thr Gly Phe Tyr  
 110 115 120  
 Thr Leu His Val Ile Lys Ser Asp Leu Val Asn Glu Glu Ala Thr  
 125 130 135  
 Gly Gln Phe Arg Val Tyr Pro Glu Leu Pro Lys Pro Ser Ile Ser  
 140 145 150  
 Ser Asn Asn Ser Lys Pro Val Glu Asp Lys Asp Ala Val Ala Phe  
 155 160 165  
 Thr Cys Glu Pro Glu Thr Gln Asp Ala Thr Tyr Leu Trp Trp Val  
 170 175 180  
 Asn Asn Gln Ser Leu Pro Val Ser Pro Arg Leu Gln Leu Ser Asn  
 185 190 195  
 Gly Asn Arg Thr Leu Thr Leu Phe Asn Val Thr Arg Asn Asp Thr  
 200 205 210  
 Ala Ser Tyr Lys Cys Glu Thr Gln Asn Pro Val Ser Ala Arg Arg  
 215 220 225  
 Ser Asp Ser Val Ile Leu Asn Val Leu Tyr Gly Pro Asp Ala Pro  
 230 235 240

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ile | Ser | Pro | Leu | Asn | Thr | Ser | Tyr | Arg | Ser | Gly | Glu | Asn | Leu | 245 | 250 | 255 |
| Asn | Leu | Ser | Cys | His | Ala | Ala | Ser | Asn | Pro | Pro | Ala | Gln | Tyr | Ser | 260 | 265 | 270 |
| Trp | Phe | Val | Asn | Gly | Thr | Phe | Gln | Gln | Ser | Thr | Gln | Glu | Leu | Phe | 275 | 280 | 285 |
| Ile | Pro | Asn | Ile | Thr | Val | Asn | Asn | Ser | Gly | Ser | Tyr | Thr | Cys | Gln | 290 | 295 | 300 |
| Ala | His | Asn | Ser | Asp | Thr | Gly | Leu | Asn | Arg | Thr | Thr | Val | Thr | Thr | 305 | 310 | 315 |
| Ile | Thr | Val | Tyr | Ala | Glu | Pro | Pro | Lys | Pro | Phe | Ile | Thr | Ser | Asn | 320 | 325 | 330 |
| Asn | Ser | Asn | Pro | Val | Glu | Asp | Glu | Asp | Ala | Val | Ala | Leu | Thr | Cys | 335 | 340 | 345 |
| Glu | Pro | Glu | Ile | Gln | Asn | Thr | Thr | Tyr | Leu | Trp | Trp | Val | Asn | Asn | 350 | 355 | 360 |
| Gln | Ser | Leu | Pro | Val | Ser | Pro | Arg | Leu | Gln | Leu | Ser | Asn | Asp | Asn | 365 | 370 | 375 |
| Arg | Thr | Leu | Thr | Leu | Leu | Ser | Val | Thr | Arg | Asn | Asp | Val | Gly | Pro | 380 | 385 | 390 |
| Tyr | Glu | Cys | Gly | Ile | Gln | Asn | Glu | Leu | Ser | Val | Asp | His | Ser | Asp | 395 | 400 | 405 |
| Pro | Val | Ile | Leu | Asn | Val | Leu | Tyr | Gly | Pro | Asp | Asp | Pro | Thr | Ile | 410 | 415 | 420 |
| Ser | Pro | Ser | Tyr | Thr | Tyr | Tyr | Arg | Pro | Gly | Val | Asn | Leu | Ser | Leu | 425 | 430 | 435 |
| Ser | Cys | His | Ala | Ala | Ser | Asn | Pro | Pro | Ala | Gln | Tyr | Ser | Trp | Leu | 440 | 445 | 450 |
| Ile | Asp | Gly | Asn | Ile | Gln | Gln | His | Thr | Gln | Glu | Leu | Phe | Ile | Ser | 455 | 460 | 465 |
| Asn | Ile | Thr | Glu | Lys | Asn | Ser | Gly | Leu | Tyr | Thr | Cys | Gln | Ala | Asn | 470 | 475 | 480 |
| Asn | Ser | Ala | Ser | Gly | His | Ser | Arg | Thr | Thr | Val | Lys | Thr | Ile | Thr | 485 | 490 | 495 |
| Val | Ser | Ala | Glu | Leu | Pro | Lys | Pro | Ser | Ile | Ser | Ser | Asn | Asn | Ser | 500 | 505 | 510 |
| Lys | Pro | Val | Glu | Asp | Lys | Asp | Ala | Val | Ala | Phe | Thr | Cys | Glu | Pro | 515 | 520 | 525 |
| Glu | Ala | Gln | Asn | Thr | Thr | Tyr | Leu | Trp | Trp | Val | Asn | Gly | Gln | Ser | 530 | 535 | 540 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Pro | Val | Ser | Pro | Arg | Leu | Gln | Leu | Ser | Asn | Gly | Asn | Arg | Thr |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |
| Leu | Thr | Leu | Phe | Asn | Val | Thr | Arg | Asn | Asp | Ala | Arg | Ala | Tyr | Val |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |
| Cys | Gly | Ile | Gln | Asn | Ser | Val | Ser | Ala | Asn | Arg | Ser | Asp | Pro | Val |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |
| Thr | Leu | Asp | Val | Leu | Tyr | Gly | Pro | Asp | Thr | Pro | Ile | Ile | Ser | Pro |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |
| Pro | Asp | Ser | Ser | Tyr | Leu | Ser | Gly | Ala | Asn | Leu | Asn | Leu | Ser | Cys |
|     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |
| His | Ser | Ala | Ser | Asn | Pro | Ser | Pro | Gln | Tyr | Ser | Trp | Arg | Ile | Asn |
|     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     | 630 |
| Gly | Ile | Pro | Gln | Gln | His | Thr | Gln | Val | Leu | Phe | Ile | Ala | Lys | Ile |
|     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     | 645 |
| Thr | Pro | Asn | Asn | Asn | Gly | Thr | Tyr | Ala | Cys | Phe | Val | Ser | Asn | Leu |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |
| Ala | Thr | Gly | Arg | Asn | Asn | Ser | Ile | Val | Lys | Ser | Ile | Thr | Val | Ser |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |
| Ala | Ser | Gly | Thr | Ser | Pro | Gly | Leu | Ser | Ala | Gly | Ala | Thr | Val | Gly |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |
| Ile | Met | Ile | Gly | Val | Leu | Val | Gly | Val | Ala | Leu | Ile |     |     |     |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |     |

<210> 75

<211> 2249

<212> DNA

<213> Homo sapien

<400> 75

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<212> PRT  
<213> Homo sapien

<400> 76  
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Pro Thr Thr Ala Lys Leu Thr Ile Glu Ser Thr Pro Phe Asn Val  
35 40 45  
Ala Glu Gly Lys Glu Val Leu Leu Leu Ala His Asn Leu Pro Gln  
50 55 60  
Asn Arg Ile Gly Tyr Ser Trp Tyr Lys Gly Glu Arg Val Asp Gly  
65 70 75  
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80 85 90  
Pro Gly Pro Ala Tyr Ser Gly Arg Glu Thr Ile Tyr Pro Asn Ala  
95 100 105  
Ser Leu Leu Ile Gln Asn Val Thr Gln Asn Asp Thr Gly Phe Tyr  
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Thr Leu Gln Val Ile Lys Ser Asp Leu Val Asn Glu Glu Ala Thr  
125 130 135  
Gly Gln Phe His Val Tyr Pro Glu Leu Pro Lys Pro Ser Ile Ser  
140 145 150  
Ser Asn Asn Ser Asn Pro Val Glu Asp Lys Asp Ala Val Ala Phe  
155 160 165  
Thr Cys Glu Pro Glu Val Gln Asn Thr Thr Tyr Leu Trp Trp Val  
170 175 180  
Asn Gly Gln Ser Leu Pro Val Ser Pro Arg Leu Gln Leu Ser Asn  
185 190 195  
Gly Asn Met Thr Leu Thr Leu Leu Ser Val Lys Arg Asn Asp Ala  
200 205 210  
Gly Ser Tyr Glu Cys Glu Ile Gln Asn Pro Ala Ser Ala Asn Arg  
215 220 225  
Ser Asp Pro Val Thr Leu Asn Val Leu Tyr Gly Pro Asp Val Pro  
230 235 240



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ile | Ser | Pro | Ser | Lys | Ala | Asn | Tyr | Arg | Pro | Gly | Glu | Asn | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Asn | Leu | Ser | Cys | His | Ala | Ala | Ser | Asn | Pro | Pro | Ala | Gln | Tyr | Ser |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| Trp | Phe | Ile | Asn | Gly | Thr | Phe | Gln | Gln | Ser | Thr | Gln | Glu | Leu | Phe |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Ile | Pro | Asn | Ile | Thr | Val | Asn | Asn | Ser | Gly | Ser | Tyr | Met | Cys | Gln |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |
| Ala | His | Asn | Ser | Ala | Thr | Gly | Leu | Asn | Arg | Thr | Thr | Val | Thr | Met |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |
| Ile | Thr | Val | Ser | Gly | Ser | Ala | Pro | Val | Leu | Ser | Ala | Val | Ala | Thr |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |
| Val | Gly | Ile | Thr | Ile | Gly | Val | Leu | Ala | Arg | Val | Ala | Leu | Ile |     |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     |     |

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 <212> DNA  
 <213> Homo sapien

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<210> 78  
 <211> 317  
 <212> PRT  
 <213> Homo sapien

<400> 78  
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 Asn Cys Trp Leu Arg Gln Ala Lys Asn Gly Arg Cys Gln Val Leu  
 35 40 45  
 Tyr Lys Thr Glu Leu Ser Lys Glu Glu Cys Cys Ser Thr Gly Arg  
 50 55 60  
 Leu Ser Thr Ser Trp Thr Glu Glu Asp Val Asn Asp Asn Thr Leu  
 65 70 75  
 Phe Lys Trp Met Ile Phe Asn Gly Gly Ala Pro Asn Cys Ile Pro  
 80 85 90  
 Cys Lys Glu Thr Cys Glu Asn Val Asp Cys Gly Pro Gly Lys Lys  
 95 100 105  
 Cys Arg Met Asn Lys Lys Asn Lys Pro Arg Cys Val Cys Ala Pro  
 110 115 120  
 Asp Cys Ser Asn Ile Thr Trp Lys Gly Pro Val Cys Gly Leu Asp  
 125 130 135  
 Gly Lys Thr Tyr Arg Asn Glu Cys Ala Leu Leu Lys Ala Arg Cys  
 140 145 150  
 Lys Glu Gln Pro Glu Leu Glu Val Gln Tyr Gln Gly Arg Cys Lys  
 155 160 165

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Cys | Arg | Asp | Val | Phe | Cys | Pro | Gly | Ser | Ser | Thr | Cys | Val | 170 | 175 | 180 |
| Val | Asp | Gln | Thr | Asn | Asn | Ala | Tyr | Cys | Val | Thr | Cys | Asn | Arg | Ile | 185 | 190 | 195 |
| Cys | Pro | Glu | Pro | Ala | Ser | Ser | Glu | Gln | Tyr | Leu | Cys | Gly | Asn | Asp | 200 | 205 | 210 |
| Gly | Val | Thr | Tyr | Ser | Ser | Ala | Cys | His | Leu | Arg | Lys | Ala | Thr | Cys | 215 | 220 | 225 |
| Leu | Leu | Gly | Arg | Ser | Ile | Gly | Leu | Ala | Tyr | Glu | Gly | Lys | Cys | Ile | 230 | 235 | 240 |
| Lys | Ala | Lys | Ser | Cys | Glu | Asp | Ile | Gln | Cys | Thr | Gly | Gly | Lys | Lys | 245 | 250 | 255 |
| Cys | Leu | Trp | Asp | Phe | Lys | Val | Gly | Arg | Gly | Arg | Cys | Ser | Leu | Cys | 260 | 265 | 270 |
| Asp | Glu | Leu | Cys | Pro | Asp | Ser | Lys | Ser | Asp | Glu | Pro | Val | Cys | Ala | 275 | 280 | 285 |
| Ser | Asp | Asn | Ala | Thr | Tyr | Ala | Ser | Glu | Cys | Ala | Met | Lys | Glu | Ala | 290 | 295 | 300 |
| Ala | Cys | Ser | Ser | Gly | Val | Leu | Leu | Glu | Val | Lys | His | Ser | Gly | Ser | 305 | 310 | 315 |

Cys Asn

<210> 79  
 <211> 3445  
 <212> DNA  
 <213> Homo sapien

<400> 79  
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<210> 80

<211> 211

<212> PRT

<213> Homo sapien

<400> 80

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Met | Ala | Asn | Ala | Gly | Leu | Gln | Leu | Leu | Gly | Phe | Ile | Leu | Ala | Phe | 1   | 5   | 10  | 15 |
| Leu | Gly | Trp | Ile | Gly | Ala | Ile | Val | Ser | Thr | Ala | Leu | Pro | Gln | Trp | 20  | 25  | 30  |    |
| Arg | Ile | Tyr | Ser | Tyr | Ala | Gly | Asp | Asn | Ile | Val | Thr | Ala | Gln | Ala | 35  | 40  | 45  |    |
| Met | Tyr | Glu | Gly | Leu | Trp | Met | Ser | Cys | Val | Ser | Gln | Ser | Thr | Gly | 50  | 55  | 60  |    |
| Gln | Ile | Gln | Cys | Lys | Val | Phe | Asp | Ser | Leu | Leu | Asn | Leu | Ser | Ser | 65  | 70  | 75  |    |
| Thr | Leu | Gln | Ala | Thr | Arg | Ala | Leu | Met | Val | Val | Gly | Ile | Leu | Leu | 80  | 85  | 90  |    |
| Gly | Val | Ile | Ala | Ile | Phe | Val | Ala | Thr | Val | Gly | Met | Lys | Cys | Met | 95  | 100 | 105 |    |
| Lys | Cys | Leu | Glu | Asp | Asp | Glu | Val | Gln | Lys | Met | Arg | Met | Ala | Val | 110 | 115 | 120 |    |
| Ile | Gly | Gly | Ala | Ile | Phe | Leu | Leu | Ala | Gly | Leu | Ala | Ile | Leu | Val | 125 | 130 | 135 |    |
| Ala | Thr | Ala | Trp | Tyr | Gly | Asn | Arg | Ile | Val | Gln | Glu | Phe | Tyr | Asp | 140 | 145 | 150 |    |
| Pro | Met | Thr | Pro | Val | Asn | Ala | Arg | Tyr | Glu | Phe | Gly | Gln | Ala | Leu | 155 | 160 | 165 |    |
| Phe | Thr | Gly | Trp | Ala | Ala | Ala | Ser | Leu | Cys | Leu | Leu | Gly | Gly | Ala | 170 | 175 | 180 |    |
| Leu | Leu | Cys | Cys | Ser | Cys | Pro | Arg | Lys | Thr | Thr | Ser | Tyr | Pro | Thr | 185 | 190 | 195 |    |
| Pro | Arg | Pro | Tyr | Pro | Lys | Pro | Ala | Pro | Ser | Ser | Gly | Lys | Asp | Tyr | 200 | 205 | 210 |    |

Val

<210> 81

<211> 1233

<212> DNA

<213> Homo sapien

<400> 81

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Leu | Gln | Ala | Ala | Arg | Ala | Leu | Met | Val | Ile | Ser | Cys | Leu | Leu | 80  | 85  | 90  |
| Ser | Gly | Ile | Ala | Cys | Ala | Cys | Ala | Val | Ile | Gly | Met | Lys | Cys | Thr | 95  | 100 | 105 |
| Arg | Cys | Ala | Lys | Gly | Thr | Pro | Ala | Lys | Thr | Thr | Phe | Ala | Ile | Leu | 110 | 115 | 120 |
| Gly | Gly | Thr | Leu | Phe | Ile | Leu | Ala | Gly | Leu | Leu | Cys | Met | Val | Ala | 125 | 130 | 135 |
| Val | Ser | Trp | Thr | Thr | Asn | Asp | Val | Val | Gln | Asn | Phe | Tyr | Asn | Pro | 140 | 145 | 150 |
| Leu | Leu | Pro | Ser | Gly | Met | Lys | Phe | Glu | Ile | Gly | Gln | Ala | Leu | Tyr | 155 | 160 | 165 |
| Leu | Gly | Phe | Ile | Ser | Ser | Ser | Leu | Ser | Leu | Ile | Gly | Gly | Thr | Leu | 170 | 175 | 180 |
| Leu | Cys | Leu | Ser | Cys | Gln | Asp | Glu | Ala | Pro | Tyr | Arg | Pro | Tyr | Gln | 185 | 190 | 195 |
| Ala | Pro | Pro | Arg | Ala | Thr | Thr | Thr | Thr | Ala | Asn | Thr | Ala | Pro | Ala | 200 | 205 | 210 |
| Tyr | Gln | Pro | Pro | Ala | Ala | Tyr | Lys | Asp | Asn | Arg | Ala | Pro | Ser | Val | 215 | 220 | 225 |
| Thr | Ser | Ala | Thr | His | Ser | Gly | Tyr | Arg | Leu | Asn | Asp | Tyr | Val |     | 230 | 235 |     |

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<213> Homo sapien

<400> 84

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| Met | Gly | Ala | Asp | Gly | Glu | Thr | Val | Val | Leu | Lys | Asn | Met | Leu | Ile |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     | 15  |     |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Val | Asn | Leu | Ile | Leu | Leu | Gly | Ser | Met | Ile | Lys | Pro | Ser | Glu |
|     |     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Gln | Leu | Glu | Val | Thr | Thr | Glu | Arg | Val | Gln | Arg | Gln | Ser | Val |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Glu | Glu | Gly | Gly | Ile | Ala | Asn | Tyr | Asn | Thr | Ser | Ser | Lys | Glu | 50  | 55  | 60  |
| Gln | Pro | Val | Val | Phe | Asn | His | Val | Tyr | Asn | Ile | Asn | Val | Pro | Leu | 65  | 70  | 75  |
| Asp | Asn | Leu | Cys | Ser | Ser | Gly | Leu | Glu | Ala | Ser | Ala | Glu | Gln | Glu | 80  | 85  | 90  |
| Val | Ser | Ala | Glu | Asp | Glu | Thr | Leu | Ala | Glu | Tyr | Met | Gly | Gln | Thr | 95  | 100 | 105 |
| Ser | Asp | His | Glu | Ser | Gln | Val | Thr | Phe | Thr | His | Arg | Ile | Asn | Phe | 110 | 115 | 120 |
| Pro | Lys | Lys | Ala | Cys | Pro | Cys | Ala | Ser | Ser | Ala | Gln | Val | Leu | Gln | 125 | 130 | 135 |
| Glu | Leu | Leu | Ser | Arg | Ile | Glu | Met | Leu | Glu | Arg | Glu | Val | Ser | Val | 140 | 145 | 150 |
| Leu | Arg | Asp | Gln | Cys | Asn | Ala | Asn | Cys | Cys | Gln | Glu | Ser | Ala | Ala | 155 | 160 | 165 |
| Thr | Gly | Gln | Leu | Asp | Tyr | Ile | Pro | His | Cys | Ser | Gly | His | Gly | Asn | 170 | 175 | 180 |
| Phe | Ser | Phe | Glu | Ser | Cys | Gly | Cys | Ile | Cys | Asn | Glu | Gly | Trp | Phe | 185 | 190 | 195 |
| Gly | Lys | Asn | Cys | Ser | Glu | Pro | Tyr | Cys | Pro | Leu | Gly | Cys | Ser | Ser | 200 | 205 | 210 |
| Arg | Gly | Val | Cys | Val | Asp | Gly | Gln | Cys | Ile | Cys | Asp | Ser | Glu | Tyr | 215 | 220 | 225 |
| Ser | Gly | Asp | Asp | Cys | Ser | Glu | Leu | Arg | Cys | Pro | Thr | Asp | Cys | Ser | 230 | 235 | 240 |
| Ser | Arg | Gly | Leu | Cys | Val | Asp | Gly | Glu | Cys | Val | Cys | Glu | Glu | Pro | 245 | 250 | 255 |
| Tyr | Thr | Gly | Glu | Asp | Cys | Arg | Glu | Leu | Arg | Cys | Pro | Gly | Asp | Cys | 260 | 265 | 270 |
| Ser | Gly | Lys | Gly | Arg | Cys | Ala | Asn | Gly | Thr | Cys | Leu | Cys | Glu | Glu | 275 | 280 | 285 |
| Gly | Tyr | Val | Gly | Glu | Asp | Cys | Gly | Gln | Arg | Gln | Cys | Leu | Asn | Ala | 290 | 295 | 300 |
| Cys | Ser | Gly | Arg | Gly | Gln | Cys | Glu | Glu | Gly | Leu | Cys | Val | Cys | Glu | 305 | 310 | 315 |
| Glu | Gly | Tyr | Gln | Gly | Pro | Asp | Cys | Ser | Ala | Val | Ala | Pro | Pro | Glu | 320 | 325 | 330 |
| Asp | Leu | Arg | Val | Ala | Gly | Ile | Ser | Asp | Arg | Ser | Ile | Glu | Leu | Glu | 335 | 340 | 345 |
| Trp | Asp | Gly | Pro | Met | Ala | Val | Thr | Glu | Tyr | Val | Ile | Ser | Tyr | Gln |     |     |     |

| 350 |     |     |     |     | 355 |     |     |     |     | 360 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Thr | Ala | Leu | Gly | Gly | Leu | Gln | Leu | Gln | Gln | Arg | Val | Pro | Gly |
|     |     |     |     | 365 |     |     |     |     |     |     |     |     |     | 375 |
| Asp | Trp | Ser | Gly | Val | Thr | Ile | Thr | Glu | Leu | Glu | Pro | Gly | Leu | Thr |
|     |     |     |     | 380 |     |     |     |     |     |     |     |     |     | 390 |
| Tyr | Asn | Ile | Ser | Val | Tyr | Ala | Val | Ile | Ser | Asn | Ile | Leu | Ser | Leu |
|     |     |     |     | 395 |     |     |     |     |     |     |     |     |     | 405 |
| Pro | Ile | Thr | Ala | Lys | Val | Ala | Thr | His | Leu | Ser | Thr | Pro | Gln | Gly |
|     |     |     |     | 410 |     |     |     |     |     |     |     |     |     | 420 |
| Leu | Gln | Phe | Lys | Thr | Ile | Thr | Glu | Thr | Thr | Val | Glu | Val | Gln | Trp |
|     |     |     |     | 425 |     |     |     |     |     |     |     |     |     | 435 |
| Glu | Pro | Phe | Ser | Phe | Ser | Phe | Asp | Gly | Trp | Glu | Ile | Ser | Phe | Ile |
|     |     |     |     | 440 |     |     |     |     |     |     |     |     |     | 450 |
| Pro | Lys | Asn | Asn | Glu | Gly | Gly | Val | Ile | Ala | Gln | Val | Pro | Ser | Asp |
|     |     |     |     | 455 |     |     |     |     |     |     |     |     |     | 465 |
| Val | Thr | Ser | Phe | Asn | Gln | Thr | Gly | Leu | Lys | Pro | Gly | Glu | Glu | Tyr |
|     |     |     |     | 470 |     |     |     |     |     |     |     |     |     | 480 |
| Ile | Val | Asn | Val | Val | Ala | Leu | Lys | Glu | Gln | Ala | Arg | Ser | Pro | Pro |
|     |     |     |     | 485 |     |     |     |     |     |     |     |     |     | 495 |
| Thr | Ser | Ala | Ser | Val | Ser | Thr | Val | Ile | Asp | Gly | Pro | Thr | Gln | Ile |
|     |     |     |     | 500 |     |     |     |     |     |     |     |     |     | 510 |
| Leu | Val | Arg | Asp | Val | Ser | Asp | Thr | Val | Ala | Phe | Val | Glu | Trp | Ile |
|     |     |     |     | 515 |     |     |     |     |     |     |     |     |     | 525 |
| Pro | Pro | Arg | Ala | Lys | Val | Asp | Phe | Ile | Leu | Leu | Lys | Tyr | Gly | Leu |
|     |     |     |     | 530 |     |     |     |     |     |     |     |     |     | 540 |
| Val | Gly | Gly | Glu | Gly | Gly | Arg | Thr | Thr | Phe | Arg | Leu | Gln | Pro | Pro |
|     |     |     |     | 545 |     |     |     |     |     |     |     |     |     | 555 |
| Leu | Ser | Gln | Tyr | Ser | Val | Gln | Ala | Leu | Arg | Pro | Gly | Ser | Arg | Tyr |
|     |     |     |     | 560 |     |     |     |     |     |     |     |     |     | 570 |
| Glu | Val | Ser | Val | Ser | Ala | Val | Arg | Gly | Thr | Asn | Glu | Ser | Asp | Ser |
|     |     |     |     | 575 |     |     |     |     |     |     |     |     |     | 585 |
| Ala | Thr | Thr | Gln | Phe | Thr | Thr | Glu | Ile | Asp | Ala | Pro | Lys | Asn | Leu |
|     |     |     |     | 590 |     |     |     |     |     |     |     |     |     | 600 |
| Arg | Val | Gly | Ser | Arg | Thr | Ala | Thr | Ser | Leu | Asp | Leu | Glu | Trp | Asp |
|     |     |     |     | 605 |     |     |     |     |     |     |     |     |     | 615 |
| Asn | Ser | Glu | Ala | Glu | Val | Gln | Glu | Tyr | Lys | Val | Val | Tyr | Ser | Thr |
|     |     |     |     | 620 |     |     |     |     |     |     |     |     |     | 630 |
| Leu | Ala | Gly | Glu | Gln | Tyr | His | Glu | Val | Leu | Val | Pro | Arg | Gly | Ile |
|     |     |     |     | 635 |     |     |     |     |     |     |     |     |     | 645 |
| Gly | Pro | Thr | Thr | Arg | Ala | Thr | Leu | Thr | Asp | Leu | Val | Pro | Gly | Thr |
|     |     |     |     | 650 |     |     |     |     |     |     |     |     |     | 660 |

|                 |                     |                         |     |     |     |
|-----------------|---------------------|-------------------------|-----|-----|-----|
| Glu Tyr Gly Val | Gly Ile Ser Ala Val | Met Asn Ser Gln Gln Ser | 665 | 670 | 675 |
| Val Pro Ala Thr | Met Asn Ala Arg Thr | Glu Leu Asp Ser Pro Arg | 680 | 685 | 690 |
| Asp Leu Met Val | Thr Ala Ser Ser Glu | Thr Ser Ile Ser Leu Ile | 695 | 700 | 705 |
| Trp Thr Lys Ala | Ser Gly Pro Ile Asp | His Tyr Arg Ile Thr Phe | 710 | 715 | 720 |
| Thr Pro Ser Ser | Gly Ile Ala Ser Glu | Val Thr Val Pro Lys Asp | 725 | 730 | 735 |
| Arg Thr Ser Tyr | Thr Leu Thr Asp Leu | Glu Pro Gly Ala Glu Tyr | 740 | 745 | 750 |
| Ile Ile Ser Val | Thr Ala Glu Arg Gly | Arg Gln Gln Ser Leu Glu | 755 | 760 | 765 |
| Ser Thr Val Asp | Ala Phe Thr Gly Phe | Arg Pro Ile Ser His Leu | 770 | 775 | 780 |
| His Phe Ser His | Val Thr Ser Ser Ser | Val Asn Ile Thr Trp Ser | 785 | 790 | 795 |
| Asp Pro Ser Pro | Pro Ala Asp Arg Leu | Ile Leu Asn Tyr Ser Pro | 800 | 805 | 810 |
| Arg Asp Glu Glu | Glu Glu Met Met Glu | Val Ser Leu Asp Ala Thr | 815 | 820 | 825 |
| Lys Arg His Ala | Val Leu Met Gly Leu | Gln Pro Ala Thr Glu Tyr | 830 | 835 | 840 |
| Ile Val Asn Leu | Val Ala Val His Gly | Thr Val Thr Ser Glu Pro | 845 | 850 | 855 |
| Ile Val Gly Ser | Ile Thr Thr Gly Ile | Asp Pro Pro Lys Asp Ile | 860 | 865 | 870 |
| Thr Ile Ser Asn | Val Thr Lys Asp Ser | Val Met Val Ser Trp Ser | 875 | 880 | 885 |
| Pro Pro Val Ala | Ser Phe Asp Tyr Tyr | Arg Val Ser Tyr Arg Pro | 890 | 895 | 900 |
| Thr Gln Val Gly | Arg Leu Asp Ser Ser | Val Val Pro Asn Thr Val | 905 | 910 | 915 |
| Thr Glu Phe Thr | Ile Thr Arg Leu Asn | Pro Ala Thr Glu Tyr Glu | 920 | 925 | 930 |
| Ile Ser Leu Asn | Ser Val Arg Gly Arg | Glu Glu Ser Glu Arg Ile | 935 | 940 | 945 |
| Cys Thr Leu Val | His Thr Ala Met Asp | Asn Pro Val Asp Leu Ile | 950 | 955 | 960 |

|   |      |      |      |
|---|------|------|------|
| Ala Thr Asn Ile Thr Pro Thr Glu Ala Leu Leu Gln Trp Lys Ala | 965  | 970  | 975  |
| Pro Val Gly Glu Val Glu Asn Tyr Val Ile Val Leu Thr His Phe | 980  | 985  | 990  |
| Ala Val Ala Gly Glu Thr Ile Leu Val Asp Gly Val Ser Glu Glu | 995  | 1000 | 1005 |
| Phe Arg Leu Val Asp Leu Leu Pro Ser Thr His Tyr Thr Ala Thr | 1010 | 1015 | 1020 |
| Met Tyr Ala Thr Asn Gly Pro Leu Thr Ser Gly Thr Ile Ser Thr | 1025 | 1030 | 1035 |
| Asn Phe Ser Thr Leu Leu Asp Pro Pro Ala Asn Leu Thr Ala Ser | 1040 | 1045 | 1050 |
| Glu Val Thr Arg Gln Ser Ala Leu Ile Ser Trp Gln Pro Pro Arg | 1055 | 1060 | 1065 |
| Ala Glu Ile Glu Asn Tyr Val Leu Thr Tyr Lys Ser Thr Asp Gly | 1070 | 1075 | 1080 |
| Ser Arg Lys Glu Leu Ile Val Asp Ala Glu Asp Thr Trp Ile Arg | 1085 | 1090 | 1095 |
| Leu Glu Gly Leu Leu Glu Asn Thr Asp Tyr Thr Val Leu Leu Gln | 1100 | 1105 | 1110 |
| Ala Ala Gln Asp Thr Thr Trp Ser Ser Ile Thr Ser Thr Ala Phe | 1115 | 1120 | 1125 |
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| Leu Asn Gly Glu Leu Ser Gln Lys Leu Gln Val Tyr Cys Asp Met | 1160 | 1165 | 1170 |
| Thr Thr Asp Gly Gly Gly Trp Ile Val Phe Gln Arg Arg Gln Asn | 1175 | 1180 | 1185 |
| Gly Gln Thr Asp Phe Phe Arg Lys Trp Ala Asp Tyr Arg Val Gly | 1190 | 1195 | 1200 |
| Phe Gly Asn Val Glu Asp Glu Phe Trp Leu Gly Leu Asp Asn Ile | 1205 | 1210 | 1215 |
| His Arg Ile Thr Ser Gln Gly Arg Tyr Glu Leu Arg Val Asp Met | 1220 | 1225 | 1230 |
| Arg Asp Gly Gln Glu Ala Ala Phe Ala Ser Tyr Asp Arg Phe Ser | 1235 | 1240 | 1245 |
| Val Glu Asp Ser Arg Asn Leu Tyr Lys Leu Arg Ile Gly Ser Tyr | 1250 | 1255 | 1260 |
| Asn Gly Thr Ala Gly Asp Ser Leu Ser Tyr His Gln Gly Arg Pro |      |      |      |

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| Ile Asn Trp Tyr His Trp Lys Gly His Glu Phe Ser Ile Pro Phe |      |      |
| 1325  | 1330 | 1335 |
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| Val | Cys | Trp | Leu | Gln | Cys | Ala | Ala | Ser | Glu | Pro | Cys | Arg | Ala | Val |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Phe | Arg | Glu | Ala | Glu | Val | Thr | Leu | Glu | Ala | Gly | Gly | Ala | Glu | Gln |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Glu | Pro | Gly | Gln | Ala | Leu | Gly | Lys | Val | Phe | Met | Gly | Cys | Pro | Gly |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Gln | Glu | Pro | Ala | Leu | Phe | Ser | Thr | Asp | Asn | Asp | Asp | Phe | Thr | Val |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Arg | Asn | Gly | Glu | Thr | Val | Gln | Glu | Arg | Arg | Ser | Leu | Lys | Glu | Arg |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Asn | Pro | Leu | Lys | Ile | Phe | Pro | Ser | Lys | Arg | Ile | Leu | Arg | Arg | His |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Arg | Asp | Trp | Val | Val | Ala | Pro | Ile | Ser | Val | Pro | Glu | Asn | Gly | 110 | 115 | 120 |
| Lys | Gly | Pro | Phe | Pro | Gln | Arg | Leu | Asn | Gln | Leu | Lys | Ser | Asn | Lys | 125 | 130 | 135 |
| Asp | Arg | Asp | Thr | Lys | Ile | Phe | Tyr | Ser | Ile | Thr | Gly | Pro | Gly | Ala | 140 | 145 | 150 |
| Asp | Ser | Pro | Pro | Glu | Gly | Val | Phe | Ala | Val | Glu | Lys | Glu | Thr | Gly | 155 | 160 | 165 |
| Trp | Leu | Leu | Leu | Asn | Lys | Pro | Leu | Asp | Arg | Glu | Glu | Ile | Ala | Lys | 170 | 175 | 180 |
| Tyr | Glu | Leu | Phe | Gly | His | Ala | Val | Ser | Glu | Asn | Gly | Ala | Ser | Val | 185 | 190 | 195 |
| Glu | Asp | Pro | Met | Asn | Ile | Ser | Ile | Ile | Val | Thr | Asp | Gln | Asn | Asp | 200 | 205 | 210 |
| His | Lys | Pro | Lys | Phe | Thr | Gln | Asp | Thr | Phe | Arg | Gly | Ser | Val | Leu | 215 | 220 | 225 |
| Glu | Gly | Val | Leu | Pro | Gly | Thr | Ser | Val | Met | Gln | Val | Thr | Ala | Thr | 230 | 235 | 240 |
| Asp | Glu | Asp | Asp | Ala | Ile | Tyr | Thr | Tyr | Asn | Gly | Val | Val | Ala | Tyr | 245 | 250 | 255 |
| Ser | Ile | His | Ser | Gln | Glu | Pro | Lys | Asp | Pro | His | Asp | Leu | Met | Phe | 260 | 265 | 270 |
| Thr | Ile | His | Arg | Ser | Thr | Gly | Thr | Ile | Ser | Val | Ile | Ser | Ser | Gly | 275 | 280 | 285 |
| Leu | Asp | Arg | Glu | Lys | Val | Pro | Glu | Tyr | Thr | Leu | Thr | Ile | Gln | Ala | 290 | 295 | 300 |
| Thr | Asp | Met | Asp | Gly | Asp | Gly | Ser | Thr | Thr | Thr | Ala | Val | Ala | Val | 305 | 310 | 315 |
| Val | Glu | Ile | Leu | Asp | Ala | Asn | Asp | Asn | Ala | Pro | Met | Phe | Asp | Pro | 320 | 325 | 330 |
| Gln | Lys | Tyr | Glu | Ala | His | Val | Pro | Glu | Asn | Ala | Val | Gly | His | Glu | 335 | 340 | 345 |
| Val | Gln | Arg | Leu | Thr | Val | Thr | Asp | Leu | Asp | Ala | Pro | Asn | Ser | Pro | 350 | 355 | 360 |
| Ala | Trp | Arg | Ala | Thr | Tyr | Leu | Ile | Met | Gly | Gly | Asp | Asp | Gly | Asp | 365 | 370 | 375 |
| His | Phe | Thr | Ile | Thr | Thr | His | Pro | Glu | Ser | Asn | Gln | Gly | Ile | Leu | 380 | 385 | 390 |
| Thr | Thr | Arg | Lys | Gly | Leu | Asp | Phe | Glu | Ala | Lys | Asn | Gln | His | Thr | 395 | 400 | 405 |
| Leu | Tyr | Val | Glu | Val | Thr | Asn | Glu | Ala | Pro | Phe | Val | Leu | Lys | Leu |     |     |     |

| 410 |     |     |     |     | 415 |     |     |     |     | 420 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
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| Glu | Ala | Pro | Val | Phe | Val | Pro | Pro | Ser | Lys | Val | Val | Glu | Val | Gln |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |
| Glu | Gly | Ile | Pro | Thr | Gly | Glu | Pro | Val | Cys | Val | Tyr | Thr | Ala | Glu |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |
| Asp | Pro | Asp | Lys | Glu | Asn | Gln | Lys | Ile | Ser | Tyr | Arg | Ile | Leu | Arg |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Asp | Pro | Ala | Gly | Trp | Leu | Ala | Met | Asp | Pro | Asp | Ser | Gly | Gln | Val |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |
| Thr | Ala | Val | Gly | Thr | Leu | Asp | Arg | Glu | Asp | Glu | Gln | Phe | Val | Arg |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |
| Asn | Asn | Ile | Tyr | Glu | Val | Met | Val | Leu | Ala | Met | Asp | Asn | Gly | Ser |
|     |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |
| Pro | Pro | Thr | Thr | Gly | Thr | Gly | Thr | Leu | Leu | Leu | Thr | Leu | Ile | Asp |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |
| Val | Asn | Asp | His | Gly | Pro | Val | Pro | Glu | Pro | Arg | Gln | Ile | Thr | Ile |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |
| Cys | Asn | Gln | Ser | Pro | Val | Arg | Gln | Val | Leu | Asn | Ile | Thr | Asp | Lys |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |
| Asp | Leu | Ser | Pro | His | Thr | Ser | Pro | Phe | Gln | Ala | Gln | Leu | Thr | Asp |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |
| Asp | Ser | Asp | Ile | Tyr | Trp | Thr | Ala | Glu | Val | Asn | Glu | Glu | Gly | Asp |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |
| Thr | Val | Val | Leu | Ser | Leu | Lys | Lys | Phe | Leu | Lys | Gln | Asp | Thr | Tyr |
|     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |
| Asp | Val | His | Leu | Ser | Leu | Ser | Asp | His | Gly | Asn | Lys | Glu | Gln | Leu |
|     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     | 630 |
| Thr | Val | Ile | Arg | Ala | Thr | Val | Cys | Asp | Cys | His | Gly | His | Val | Glu |
|     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     | 645 |
| Thr | Cys | Pro | Gly | Pro | Trp | Lys | Gly | Gly | Phe | Ile | Leu | Pro | Val | Leu |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |
| Gly | Ala | Val | Leu | Ala | Leu | Leu | Phe | Leu | Leu | Leu | Val | Leu | Leu | Leu |
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| Leu | Val | Arg | Lys | Lys | Arg | Lys | Ile | Lys | Glu | Pro | Leu | Leu | Leu | Pro |
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| Glu | Asp | Asp | Thr | Arg | Asp | Asn | Val | Phe | Tyr | Tyr | Gly | Glu | Glu | Gly |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |
| Gly | Gly | Glu | Glu | Asp | Gln | Asp | Tyr | Asp | Ile | Thr | Gln | Leu | His | Arg |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Leu | Glu | Ala | Arg | Pro | Glu | Val | Val | Leu | Arg | Asn | Asp | Val | Ala |  |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |  |
| Pro | Thr | Ile | Ile | Pro | Thr | Pro | Met | Tyr | Arg | Pro | Arg | Pro | Ala | Asn |  |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |  |
| Pro | Asp | Glu | Ile | Gly | Asn | Phe | Ile | Ile | Glu | Asn | Leu | Lys | Ala | Ala |  |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |  |
| Asn | Thr | Asp | Pro | Thr | Ala | Pro | Pro | Tyr | Asp | Thr | Leu | Leu | Val | Phe |  |
|     |     |     |     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |  |
| Asp | Tyr | Glu | Gly | Ser | Gly | Ser | Asp | Ala | Ala | Ser | Leu | Ser | Ser | Leu |  |
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| Thr | Ser | Ser | Ala | Ser | Asp | Gln | Asp | Gln | Asp | Tyr | Asp | Tyr | Leu | Asn |  |
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| Glu | Trp | Gly | Ser | Arg | Phe | Lys | Lys | Leu | Ala | Asp | Met | Tyr | Gly | Gly |  |
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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gln | Pro | Ile | Asn | Thr | Ile | Tyr | Pro | Glu | Glu | Ser | Leu | Glu | Gly | Lys |  |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |  |
| Val | Ser | Leu | Asn | Cys | Arg | Ala | Arg | Ala | Ser | Pro | Phe | Pro | Val | Tyr |  |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |  |
| Lys | Trp | Arg | Met | Asn | Asn | Gly | Asp | Val | Asp | Leu | Thr | Ser | Asp | Arg |  |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |  |
| Tyr | Ser | Met | Val | Gly | Gly | Asn | Leu | Val | Ile | Asn | Asn | Pro | Asp | Lys |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Gln | Lys | Asp | Ala | Gly | Ile | Tyr | Tyr | Cys | Leu | Ala | Ser | Asn | Asn | Tyr |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Gly | Met | Val | Arg | Ser | Thr | Glu | Ala | Thr | Leu | Ser | Phe | Gly | Tyr | Leu |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Asp | Pro | Phe | Pro | Pro | Glu | Glu | Arg | Pro | Glu | Val | Arg | Val | Lys | Glu |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Gly | Lys | Gly | Met | Val | Leu | Leu | Cys | Asp | Pro | Pro | Tyr | His | Phe | Pro |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Asp | Asp | Leu | Ser | Tyr | Arg | Trp | Leu | Leu | Asn | Glu | Phe | Pro | Val | Phe |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Ile | Thr | Met | Asp | Lys | Arg | Arg | Phe | Val | Ser | Gln | Thr | Asn | Gly | Asn |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Leu | Tyr | Ile | Ala | Asn | Val | Glu | Ala | Ser | Asp | Lys | Gly | Asn | Tyr | Ser |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Cys | Phe | Val | Ser | Ser | Pro | Ser | Ile | Thr | Lys | Ser | Val | Phe | Ser | Lys |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Phe | Ile | Pro | Leu | Ile | Pro | Ile | Pro | Glu | Arg | Thr | Thr | Lys | Pro | Tyr |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Pro | Ala | Asp | Ile | Val | Val | Gln | Phe | Lys | Asp | Val | Tyr | Ala | Leu | Met |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Gly | Gln | Asn | Val | Thr | Leu | Glu | Cys | Phe | Ala | Leu | Gly | Asn | Pro | Val |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Pro | Asp | Ile | Arg | Trp | Arg | Lys | Val | Leu | Glu | Pro | Met | Pro | Ser | Thr |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Ala | Glu | Ile | Ser | Thr | Ser | Gly | Ala | Val | Leu | Lys | Ile | Phe | Asn | Ile |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Gln | Leu | Glu | Asp | Glu | Gly | Ile | Tyr | Glu | Cys | Glu | Ala | Glu | Asn | Ile |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Arg | Gly | Lys | Asp | Lys | His | Gln | Ala | Arg | Ile | Tyr | Val | Gln | Ala | Phe |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Pro | Glu | Trp | Val | Glu | His | Ile | Asn | Asp | Thr | Glu | Val | Asp | Ile | Gly |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ser | Asp | Leu | Tyr | Trp | Pro | Cys | Val | Ala | Thr | Gly | Lys | Pro | Ile | Pro |  |
|     |     |     |     | 350 |     |     |     |     |     | 355 |     |     |     | 360 |  |
| Thr | Ile | Arg | Trp | Leu | Lys | Asn | Gly | Tyr | Ala | Tyr | His | Lys | Gly | Glu |  |
|     |     |     |     | 365 |     |     |     |     |     | 370 |     |     |     | 375 |  |
| Leu | Arg | Leu | Tyr | Asp | Val | Thr | Phe | Glu | Asn | Ala | Gly | Met | Tyr | Gln |  |
|     |     |     |     | 380 |     |     |     |     |     | 385 |     |     |     | 390 |  |
| Cys | Ile | Ala | Glu | Asn | Thr | Tyr | Gly | Ala | Ile | Tyr | Ala | Asn | Ala | Glu |  |
|     |     |     |     | 395 |     |     |     |     |     | 400 |     |     |     | 405 |  |
| Leu | Lys | Ile | Leu | Ala | Leu | Ala | Pro | Thr | Phe | Glu | Met | Asn | Pro | Met |  |
|     |     |     |     | 410 |     |     |     |     |     | 415 |     |     |     | 420 |  |
| Lys | Lys | Lys | Ile | Leu | Ala | Ala | Lys | Gly | Gly | Arg | Val | Ile | Ile | Glu |  |
|     |     |     |     | 425 |     |     |     |     |     | 430 |     |     |     | 435 |  |
| Cys | Lys | Pro | Lys | Ala | Ala | Pro | Lys | Pro | Lys | Phe | Ser | Trp | Ser | Lys |  |
|     |     |     |     | 440 |     |     |     |     |     | 445 |     |     |     | 450 |  |
| Gly | Thr | Glu | Trp | Leu | Val | Asn | Ser | Ser | Arg | Ile | Leu | Ile | Trp | Glu |  |
|     |     |     |     | 455 |     |     |     |     |     | 460 |     |     |     | 465 |  |
| Asp | Gly | Ser | Leu | Glu | Ile | Asn | Asn | Ile | Thr | Arg | Asn | Asp | Gly | Gly |  |
|     |     |     |     | 470 |     |     |     |     |     | 475 |     |     |     | 480 |  |
| Ile | Tyr | Thr | Cys | Phe | Ala | Glu | Asn | Asn | Arg | Gly | Lys | Ala | Asn | Ser |  |
|     |     |     |     | 485 |     |     |     |     |     | 490 |     |     |     | 495 |  |
| Thr | Gly | Thr | Leu | Val | Ile | Thr | Asp | Pro | Thr | Arg | Ile | Ile | Leu | Ala |  |
|     |     |     |     | 500 |     |     |     |     |     | 505 |     |     |     | 510 |  |
| Pro | Ile | Asn | Ala | Asp | Ile | Thr | Val | Gly | Glu | Asn | Ala | Thr | Met | Gln |  |
|     |     |     |     | 515 |     |     |     |     |     | 520 |     |     |     | 525 |  |
| Cys | Ala | Ala | Ser | Phe | Asp | Pro | Ala | Leu | Asp | Leu | Thr | Phe | Val | Trp |  |
|     |     |     |     | 530 |     |     |     |     |     | 535 |     |     |     | 540 |  |
| Ser | Phe | Asn | Gly | Tyr | Val | Ile | Asp | Phe | Asn | Lys | Glu | Asn | Ile | His |  |
|     |     |     |     | 545 |     |     |     |     |     | 550 |     |     |     | 555 |  |
| Tyr | Gln | Arg | Asn | Phe | Met | Leu | Asp | Ser | Asn | Gly | Glu | Leu | Leu | Ile |  |
|     |     |     |     | 560 |     |     |     |     |     | 565 |     |     |     | 570 |  |
| Arg | Asn | Ala | Gln | Leu | Lys | His | Ala | Gly | Arg | Tyr | Thr | Cys | Thr | Ala |  |
|     |     |     |     | 575 |     |     |     |     |     | 580 |     |     |     | 585 |  |
| Gln | Thr | Ile | Val | Asp | Asn | Ser | Ser | Ala | Ser | Ala | Asp | Leu | Val | Val |  |
|     |     |     |     | 590 |     |     |     |     |     | 595 |     |     |     | 600 |  |
| Arg | Gly | Pro | Pro | Gly | Pro | Pro | Gly | Gly | Leu | Arg | Ile | Glu | Asp | Ile |  |
|     |     |     |     | 605 |     |     |     |     |     | 610 |     |     |     | 615 |  |
| Arg | Ala | Thr | Ser | Val | Ala | Leu | Thr | Trp | Ser | Arg | Gly | Ser | Asp | Asn |  |
|     |     |     |     | 620 |     |     |     |     |     | 625 |     |     |     | 630 |  |
| His | Ser | Pro | Ile | Ser | Lys | Tyr | Thr | Ile | Gln | Thr | Lys | Thr | Ile | Leu |  |
|     |     |     |     | 635 |     |     |     |     |     | 640 |     |     |     | 645 |  |
| Ser | Asp | Asp | Trp | Lys | Asp | Ala | Lys | Thr | Asp | Pro | Pro | Ile | Ile | Glu |  |

| 650 |     |     |     |     | 655 |     |     |     |     | 660 |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Asn | Met | Glu | Ala | Ala | Arg | Ala | Val | Asp | Leu | Ile | Pro | Trp | Met |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |
| Glu | Tyr | Glu | Phe | Arg | Val | Val | Ala | Thr | Asn | Thr | Leu | Gly | Arg | Gly |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |
| Glu | Pro | Ser | Ile | Pro | Ser | Asn | Arg | Ile | Lys | Thr | Asp | Gly | Ala | Ala |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |
| Pro | Asn | Val | Ala | Pro | Ser | Asp | Val | Gly | Gly | Gly | Gly | Gly | Arg | Asn |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Arg | Glu | Leu | Thr | Ile | Thr | Trp | Ala | Pro | Leu | Ser | Arg | Glu | Tyr | His |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |
| Tyr | Gly | Asn | Asn | Phe | Gly | Tyr | Ile | Val | Ala | Phe | Lys | Pro | Phe | Asp |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |
| Gly | Glu | Glu | Trp | Lys | Lys | Val | Thr | Val | Thr | Asn | Pro | Asp | Thr | Gly |
|     |     |     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |
| Arg | Tyr | Val | His | Lys | Asp | Glu | Thr | Met | Ser | Pro | Ser | Thr | Ala | Phe |
|     |     |     |     | 770 |     |     |     |     | 775 |     |     |     |     | 780 |
| Gln | Val | Lys | Val | Lys | Ala | Phe | Asn | Asn | Lys | Gly | Asp | Gly | Pro | Tyr |
|     |     |     |     | 785 |     |     |     |     | 790 |     |     |     |     | 795 |
| Ser | Leu | Val | Ala | Val | Ile | Asn | Ser | Ala | Gln | Asp | Ala | Pro | Ser | Glu |
|     |     |     |     | 800 |     |     |     |     | 805 |     |     |     |     | 810 |
| Ala | Pro | Thr | Glu | Val | Gly | Val | Lys | Val | Leu | Ser | Ser | Ser | Glu | Ile |
|     |     |     |     | 815 |     |     |     |     | 820 |     |     |     |     | 825 |
| Ser | Val | His | Trp | Glu | His | Val | Leu | Glu | Lys | Ile | Val | Glu | Ser | Tyr |
|     |     |     |     | 830 |     |     |     |     | 835 |     |     |     |     | 840 |
| Gln | Ile | Arg | Tyr | Trp | Ala | Ala | His | Asp | Lys | Glu | Glu | Ala | Ala | Asn |
|     |     |     |     | 845 |     |     |     |     | 850 |     |     |     |     | 855 |
| Arg | Val | Gln | Val | Thr | Ser | Gln | Glu | Tyr | Ser | Ala | Arg | Leu | Glu | Asn |
|     |     |     |     | 860 |     |     |     |     | 865 |     |     |     |     | 870 |
| Leu | Leu | Pro | Asp | Thr | Gln | Tyr | Phe | Ile | Glu | Val | Gly | Ala | Cys | Asn |
|     |     |     |     | 875 |     |     |     |     | 880 |     |     |     |     | 885 |
| Ser | Ala | Gly | Cys | Gly | Pro | Pro | Ser | Asp | Met | Ile | Glu | Ala | Phe | Thr |
|     |     |     |     | 890 |     |     |     |     | 895 |     |     |     |     | 900 |
| Lys | Lys | Ala | Pro | Pro | Ser | Gln | Pro | Pro | Arg | Ile | Ile | Ser | Ser | Val |
|     |     |     |     | 905 |     |     |     |     | 910 |     |     |     |     | 915 |
| Arg | Ser | Gly | Ser | Arg | Tyr | Ile | Ile | Thr | Trp | Asp | His | Val | Val | Ala |
|     |     |     |     | 920 |     |     |     |     | 925 |     |     |     |     | 930 |
| Leu | Ser | Asn | Glu | Ser | Thr | Val | Thr | Gly | Tyr | Lys | Val | Leu | Tyr | Arg |
|     |     |     |     | 935 |     |     |     |     | 940 |     |     |     |     | 945 |
| Pro | Asp | Gly | Gln | His | Asp | Gly | Lys | Leu | Tyr | Ser | Thr | His | Lys | His |
|     |     |     |     | 950 |     |     |     |     | 955 |     |     |     |     | 960 |

|     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Ser | Ile | Glu | Val | Pro  | Ile | Pro | Arg | Asp | Gly  | Glu | Tyr | Val | Val | Glu  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
|     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |
| Val | Arg | Ala | His | Ser  | Asp | Gly | Gly | Asp | Gly  | Val | Val | Ser | Gln | Val  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
|     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |
| Lys | Ile | Ser | Gly | Ala  | Pro | Thr | Leu | Ser | Pro  | Ser | Leu | Leu | Gly | Leu  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
|     |     |     |     |      |     |     |     |     |      |     |     |     |     |      |
| Leu | Leu | Pro | Ala | Phe  | Gly | Ile | Leu | Val | Tyr  | Leu | Glu | Phe |     |      |
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                35                40                45

Pro Asp Pro Ser Gln Lys Gln Asn Leu Leu Ala Pro Gln Thr Leu
                50                55                60

Pro Ser Lys Ser Asn Glu Ser His Asp His Met Asp Asp Met Asp
                65                70                75

Asp Glu Asp Asp Asp Asp His Val Asp Ser Gln Asp Ser Ile Asp
                80                85                90

Ser Asn Asp Ser Asp Asp Val Asp Asp Thr Asp Asp Ser His Gln
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Ser Asp Glu Ser His His Ser Asp Glu Ser Asp Glu Leu Val Thr
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Asp Phe Pro Thr Asp Leu Pro Ala Thr Glu Val Phe Thr Pro Val
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Val Pro Thr Val Asp Thr Tyr Asp Gly Arg Gly Asp Ser Val Val
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Tyr Gly Leu Arg Ser Lys Ser Lys Lys Phe Arg Arg Pro Asp Ile

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|                 | 155                 | 160                 | 165 |
|-----------------|---------------------|---------------------|-----|
| Gln Tyr Pro Asp | Ala Thr Asp Glu Asp | Ile Thr Ser His Met | Glu |
|                 | 170                 | 175                 | 180 |
| Ser Glu Glu Leu | Asn Gly Ala Tyr Lys | Ala Ile Pro Val Ala | Gln |
|                 | 185                 | 190                 | 195 |
| Asp Leu Asn Ala | Pro Ser Asp Trp Asp | Ser Arg Gly Lys Asp | Ser |
|                 | 200                 | 205                 | 210 |
| Tyr Glu Thr Ser | Gln Leu Asp Asp Gln | Ser Ala Glu Thr His | Ser |
|                 | 215                 | 220                 | 225 |
| His Lys Gln Ser | Arg Leu Tyr Lys Arg | Lys Ala Asn Asp Glu | Ser |
|                 | 230                 | 235                 | 240 |
| Asn Glu His Ser | Asp Val Ile Asp Ser | Gln Glu Leu Ser Lys | Val |
|                 | 245                 | 250                 | 255 |
| Ser Arg Glu Phe | His Ser His Glu Phe | His Ser His Glu Asp | Met |
|                 | 260                 | 265                 | 270 |
| Leu Val Val Asp | Pro Lys Ser Lys Glu | Glu Asp Lys His Leu | Lys |
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 Gln Leu Gln Thr Val Ser Pro Ser Trp Asp Leu Gln Gly His Gly  
 185 190 195

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Glu | Thr | Phe | Cys | Ser | Val | Leu | Trp | Thr | Arg | Val | Phe | Leu | Glu |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Ile | Ala | Phe | Cys | Arg | Pro | Ile | Gly | Leu | Thr | Val | Ala | Ser | Phe | Gln |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Ser | Leu | Pro | Phe | Ala | Ala | Arg | Leu | Asn | Thr | Pro | Met | Gly | Pro | Gly |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Arg | Thr | Val | Val | Val | Lys | Gly | Glu | Val | Asn | Ala | Asn | Ala | Lys | Ser |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Phe | Asn | Val | Asp | Leu | Leu | Ala | Gly | Lys | Ser | Lys | Asp | Ile | Ala | Leu |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| His | Leu | Asn | Pro | Arg | Leu | Asn | Ile | Lys | Ala | Phe | Val | Arg | Asn | Ser |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Phe | Leu | Gln | Glu | Ser | Trp | Gly | Glu | Glu | Glu | Arg | Asn | Ile | Thr | Ser |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |
| Phe | Pro | Phe | Ser | Pro | Gly | Met | Tyr | Phe | Glu | Met | Ile | Ile | Tyr | Cys |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |
| Asp | Val | Arg | Glu | Phe | Lys | Val | Ala | Val | Asn | Gly | Val | His | Ser | Leu |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |
| Glu | Tyr | Lys | His | Arg | Phe | Lys | Glu | Leu | Ser | Ser | Ile | Asp | Thr | Leu |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |
| Glu | Ile | Asn | Gly | Asp | Ile | His | Leu | Leu | Glu | Val | Arg | Ser | Trp |     |
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<211> 368

<212> PRT

<213> Homo sapien

<400> 94

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| Met | Trp | Pro | Leu | Trp | Arg | Leu | Val | Ser | Leu | Leu | Ala | Leu | Ser | Gln |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |
| Ala | Leu | Pro | Phe | Glu | Gln | Arg | Gly | Phe | Trp | Asp | Phe | Thr | Leu | Asp |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Asp | Gly | Pro | Phe | Met | Met | Asn | Asp | Glu | Glu | Ala | Ser | Gly | Ala | Asp |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Thr | Ser | Gly | Val | Leu | Asp | Pro | Asp | Ser | Val | Thr | Pro | Thr | Tyr | Ser |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Ala | Met | Cys | Pro | Phe | Gly | Cys | His | Cys | His | Leu | Arg | Val | Val | Gln |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Cys | Ser | Asp | Leu | Gly | Leu | Lys | Ser | Val | Pro | Lys | Glu | Ile | Ser | Pro |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Asp | Thr | Thr | Leu | Leu | Asp | Leu | Gln | Asn | Asn | Asp | Ile | Ser | Glu | Leu |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Arg | Lys | Asp | Asp | Phe | Lys | Gly | Leu | Gln | His | Leu | Tyr | Ala | Leu | Val |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| Leu | Val | Asn | Asn | Lys | Ile | Ser | Lys | Ile | His | Glu | Lys | Ala | Phe | Ser |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Pro | Leu | Arg | Lys | Leu | Gln | Lys | Leu | Tyr | Ile | Ser | Lys | Asn | His | Leu |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Val | Glu | Ile | Pro | Pro | Asn | Leu | Pro | Ser | Ser | Leu | Val | Glu | Leu | Arg |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Ile | His | Asp | Asn | Arg | Ile | Arg | Lys | Val | Pro | Lys | Gly | Val | Phe | Ser |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Gly | Leu | Arg | Asn | Met | Asn | Cys | Ile | Glu | Met | Gly | Gly | Asn | Pro | Leu |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Asn | Ser | Gly | Phe | Glu | Pro | Gly | Ala | Phe | Asp | Gly | Leu | Lys | Leu | 200 | 205 | 210 |
| Asn | Tyr | Leu | Arg | Ile | Ser | Glu | Ala | Lys | Leu | Thr | Gly | Ile | Pro | Lys | 215 | 220 | 225 |
| Asp | Leu | Pro | Glu | Thr | Leu | Asn | Glu | Leu | His | Leu | Asp | His | Asn | Lys | 230 | 235 | 240 |
| Ile | Gln | Ala | Ile | Glu | Leu | Glu | Asp | Leu | Leu | Arg | Tyr | Ser | Lys | Leu | 245 | 250 | 255 |
| Tyr | Arg | Leu | Gly | Leu | Gly | His | Asn | Gln | Ile | Arg | Met | Ile | Glu | Asn | 260 | 265 | 270 |
| Gly | Ser | Leu | Ser | Phe | Leu | Pro | Thr | Leu | Arg | Glu | Leu | His | Leu | Asp | 275 | 280 | 285 |
| Asn | Asn | Lys | Leu | Ala | Arg | Val | Pro | Ser | Gly | Leu | Pro | Asp | Leu | Lys | 290 | 295 | 300 |
| Leu | Leu | Gln | Val | Val | Tyr | Leu | His | Ser | Asn | Asn | Ile | Thr | Lys | Val | 305 | 310 | 315 |
| Gly | Val | Asn | Asp | Phe | Cys | Pro | Met | Gly | Phe | Gly | Val | Lys | Arg | Ala | 320 | 325 | 330 |
| Tyr | Tyr | Asn | Gly | Ile | Ser | Leu | Phe | Asn | Asn | Pro | Val | Pro | Tyr | Trp | 335 | 340 | 345 |
| Glu | Val | Gln | Pro | Ala | Thr | Phe | Arg | Cys | Val | Thr | Asp | Arg | Leu | Ala | 350 | 355 | 360 |
| Ile | Gln | Phe | Gly | Asn | Tyr | Lys | Lys |     |     |     |     |     |     |     | 365 |     |     |

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<400> 96

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Met | Arg | Pro | Arg | Ser | Ala | Leu | Pro | Arg | Leu | Leu | Leu | Pro | Leu | Leu | 1   | 5   | 10  | 15 |
| Leu | Leu | Pro | Ala | Ala | Gly | Pro | Ala | Gln | Phe | His | Gly | Glu | Lys | Gly | 20  | 25  | 30  |    |
| Ile | Ser | Ile | Pro | Asp | His | Gly | Phe | Cys | Gln | Pro | Ile | Ser | Ile | Pro | 35  | 40  | 45  |    |
| Leu | Cys | Thr | Asp | Ile | Ala | Tyr | Asn | Gln | Thr | Ile | Met | Pro | Asn | Leu | 50  | 55  | 60  |    |
| Leu | Gly | His | Thr | Asn | Gln | Glu | Asp | Ala | Gly | Leu | Glu | Val | His | Gln | 65  | 70  | 75  |    |
| Phe | Tyr | Pro | Leu | Val | Lys | Val | Gln | Cys | Ser | Pro | Glu | Leu | Arg | Phe | 80  | 85  | 90  |    |
| Phe | Leu | Cys | Ser | Met | Tyr | Ala | Pro | Val | Cys | Thr | Val | Leu | Glu | Gln | 95  | 100 | 105 |    |
| Ala | Ile | Pro | Pro | Cys | Arg | Ser | Ile | Cys | Glu | Arg | Ala | Arg | Gln | Gly | 110 | 115 | 120 |    |
| Cys | Glu | Ala | Leu | Met | Asn | Lys | Phe | Gly | Phe | Gln | Trp | Pro | Glu | Arg | 125 | 130 | 135 |    |
| Leu | Arg | Cys | Glu | His | Phe | Pro | Arg | His | Gly | Ala | Glu | Gln | Ile | Cys | 140 | 145 | 150 |    |
| Val | Gly | Gln | Asn | His | Ser | Glu | Asp | Gly | Ala | Pro | Ala | Leu | Leu | Thr | 155 | 160 | 165 |    |
| Thr | Ala | Pro | Pro | Pro | Gly | Leu | Gln | Pro | Gly | Ala | Gly | Gly | Thr | Pro | 170 | 175 | 180 |    |
| Gly | Gly | Pro | Gly | Gly | Gly | Gly | Ala | Pro | Pro | Arg | Tyr | Ala | Thr | Leu | 185 | 190 | 195 |    |
| Glu | His | Pro | Phe | His | Cys | Pro | Arg | Val | Leu | Lys | Val | Pro | Ser | Tyr | 200 | 205 | 210 |    |
| Leu | Ser | Tyr | Lys | Phe | Leu | Gly | Glu | Arg | Asp | Cys | Ala | Ala | Pro | Cys | 215 | 220 | 225 |    |
| Glu | Pro | Ala | Arg | Pro | Asp | Gly | Ser | Met | Phe | Phe | Ser | Gln | Glu | Glu | 230 | 235 | 240 |    |
| Thr | Arg | Phe | Ala | Arg | Leu | Trp | Ile | Leu | Thr | Trp | Ser | Val | Leu | Cys | 245 | 250 | 255 |    |
| Cys | Ala | Ser | Thr | Phe | Phe | Thr | Val | Thr | Thr | Tyr | Leu | Val | Asp | Met | 260 | 265 | 270 |    |
| Gln | Arg | Phe | Arg | Tyr | Pro | Glu | Arg | Pro | Ile | Ile | Phe | Leu | Ser | Gly |     |     |     |    |

|                 | 275                 |                     | 280 |  | 285 |
|-----------------|---------------------|---------------------|-----|--|-----|
| Cys Tyr Thr Met | Val Ser Val Ala Tyr | Ile Ala Gly Phe Val | Leu |  |     |
|                 | 290                 |                     | 295 |  | 300 |
| Gln Glu Arg Val | Val Cys Asn Glu Arg | Phe Ser Glu Asp Gly | Tyr |  |     |
|                 | 305                 |                     | 310 |  | 315 |
| Arg Thr Val Val | Gln Gly Thr Lys Lys | Glu Gly Cys Thr Ile | Leu |  |     |
|                 | 320                 |                     | 325 |  | 330 |
| Phe Met Met Leu | Tyr Phe Phe Ser Met | Ala Ser Ser Ile Trp | Trp |  |     |
|                 | 335                 |                     | 340 |  | 345 |
| Val Ile Leu Ser | Leu Thr Trp Phe Leu | Ala Ala Gly Met Lys | Trp |  |     |
|                 | 350                 |                     | 355 |  | 360 |
| Gly His Glu Ala | Ile Glu Ala Asn Ser | Gln Tyr Phe His Leu | Ala |  |     |
|                 | 365                 |                     | 370 |  | 375 |
| Ala Trp Ala Val | Pro Ala Val Lys Thr | Ile Thr Ile Leu Ala | Met |  |     |
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| Gly Gln Ile Asp | Gly Asp Leu Leu Ser | Gly Val Cys Phe Val | Gly |  |     |
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| Leu Asn Ser Leu | Asp Pro Leu Arg Gly | Phe Val Leu Ala Pro | Leu |  |     |
|                 | 410                 |                     | 415 |  | 420 |
| Phe Val Tyr Leu | Phe Ile Gly Thr Ser | Phe Leu Leu Ala Gly | Phe |  |     |
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| Lys Thr Glu Lys | Leu Glu Arg Leu Met | Val Arg Ile Gly Val | Phe |  |     |
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| Ser Val Leu Tyr | Thr Val Pro Ala Thr | Ile Val Ile Ala Cys | Tyr |  |     |
|                 | 470                 |                     | 475 |  | 480 |
| Phe Tyr Glu Gln | Ala Phe Arg Glu His | Trp Glu Arg Ser Trp | Val |  |     |
|                 | 485                 |                     | 490 |  | 495 |
| Ser Gln His Cys | Lys Ser Leu Ala Ile | Pro Cys Pro Ala His | Tyr |  |     |
|                 | 500                 |                     | 505 |  | 510 |
| Thr Pro Arg Met | Ser Pro Asp Phe Thr | Val Tyr Met Ile Lys | Tyr |  |     |
|                 | 515                 |                     | 520 |  | 525 |
| Leu Met Thr Leu | Ile Val Gly Ile Thr | Ser Gly Phe Trp Ile | Trp |  |     |
|                 | 530                 |                     | 535 |  | 540 |
| Ser Gly Lys Thr | Leu His Ser Trp Arg | Lys Phe Tyr Thr Arg | Leu |  |     |
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|                 |                     |                         |
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| Leu Gln Leu Asn | His Asn Arg Leu His | Thr Leu Ala Glu Gly Thr |
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| Pro Phe Asp Cys | Thr Cys Gly Ile Val | Trp Leu Lys Thr Trp Ala |
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| Ser Gln Asp Gly | Ala Glu Leu Arg Pro | Gly Phe Val Leu Ala Leu |
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| His Cys Asp Val | Asp Gly Gln Pro Ala | Pro Gln Leu His Trp His |
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| Ile Gln Ile Pro | Ser Gly Ile Val Glu | Ile Thr Ser Pro Asn Val |
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| Gly Thr Asp Gly | Arg Ala Leu Pro Gly | Thr Pro Val Ala Ser Ser |
| 290             | 295                 | 300                     |
| Gln Pro Arg Phe | Gln Ala Phe Ala Asn | Gly Ser Leu Leu Ile Pro |
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| Asp Phe Gly Lys | Leu Glu Glu Gly Thr | Tyr Ser Cys Leu Ala Thr |
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| Asn Glu Leu Gly | Ser Ala Glu Ser Ser | Val Asp Val Ala Leu Ala |
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| Thr Pro Gly Glu | Gly Gly Glu Asp Thr | Leu Gly Arg Arg Phe His |
| 350             | 355                 | 360                     |
| Gly Lys Ala Val | Glu Gly Lys Gly Cys | Tyr Thr Val Asp Asn Glu |
| 365             | 370                 | 375                     |
| Val Gln Pro Ser | Gly Pro Glu Asp Asn | Val Val Ile Ile Tyr Leu |
| 380             | 385                 | 390                     |
| Ser Arg Ala Gly | Asn Pro Glu Ala Ala | Val Ala Glu Gly Val Pro |
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Gly Glu Thr Phe Thr Ile Arg Ala Glu Asp Gly Thr Leu Gln Cys
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| Ile | Gln | Gly | Pro | Ala | Glu | Val | Pro | Met | Met | Ser | Pro | Asn | Gly | Ser |  | 65  | 70  | 75  |
| Ile | Pro | Pro | Ile | His | Val | Pro | Pro | Gly | Tyr | Ile | Ser | Gln | Val | Ile |  | 80  | 85  | 90  |
| Glu | Asp | Ser | Thr | Gly | Val | Arg | Arg | Val | Val | Val | Thr | Pro | Gln | Ser |  | 95  | 100 | 105 |
| Pro | Glu | Cys | Tyr | Pro | Pro | Ser | Tyr | Pro | Ser | Ala | Met | Ser | Pro | Thr |  | 110 | 115 | 120 |
| His | His | Leu | Pro | Pro | Tyr | Leu | Thr | His | His | Pro | His | Phe | Ile | His |  | 125 | 130 | 135 |
| Asn | Ser | His | Thr | Ala | Tyr | Tyr | Pro | Pro | Val | Thr | Gly | Pro | Gly | Asp |  | 140 | 145 | 150 |
| Met | Pro | Pro | Gln | Phe | Phe | Pro | Gln | His | His | Leu | Pro | His | Thr | Ile |  | 155 | 160 | 165 |
| Tyr | Gly | Glu | Gln | Glu | Ile | Ile | Pro | Phe | Tyr | Gly | Met | Ser | Ser | Tyr |  | 170 | 175 | 180 |
| Ile | Thr | Arg | Glu | Asp | Gln | Tyr | Ser | Lys | Pro | Pro | His | Lys | Lys | Leu |  | 185 | 190 | 195 |
| Lys | Asp | Arg | Gln | Ile | Asp | Arg | Gln | Asn | Arg | Leu | Asn | Arg | Pro | Pro |  | 200 | 205 | 210 |
| Ser | Ala | Ile | Tyr | Lys | Ser | Ser | Cys | Thr | Thr | Val | Tyr | Asn | Gly | Tyr |  | 215 | 220 | 225 |
| Gly | Lys | Gly | His | Ser | Gly | Gly | Ser | Gly | Gly | Gly | Gly | Ser | Gly | Ser |  | 230 | 235 | 240 |
| Gly | Pro | Gly | Ile | Lys | Lys | Thr | Glu | Arg | Arg | Ala | Arg | Ser | Ser | Pro |  | 245 | 250 | 255 |
| Lys | Ser | Asn | Asp | Ser | Asp | Leu | Gln | Glu | Tyr | Glu | Leu | Glu | Val | Lys |  | 260 | 265 | 270 |
| Arg | Val | Gln | Asp | Ile | Leu | Ser | Gly | Ile | Glu | Lys | Pro | Gln | Val | Ser |  | 275 | 280 | 285 |
| Asn | Ile | Gln | Ala | Arg | Ala | Val | Val | Leu | Ser | Trp | Ala | Pro | Pro | Val |  | 290 | 295 | 300 |
| Gly | Leu | Ser | Cys | Gly | Pro | His | Ser | Gly | Leu | Ser | Phe | Pro | Tyr | Ser |  | 305 | 310 | 315 |
| Tyr | Glu | Val | Ala | Leu | Ser | Asp | Lys | Gly | Arg | Asp | Gly | Lys | Tyr | Lys |  | 320 | 325 | 330 |
| Ile | Ile | Tyr | Ser | Gly | Glu | Glu | Leu | Glu | Cys | Asn | Leu | Lys | Asp | Leu |  | 335 | 340 | 345 |
| Arg | Pro | Ala | Thr | Asp | Tyr | His | Val | Arg | Val | Tyr | Ala | Met | Tyr | Asn |  | 350 | 355 | 360 |

|                 |                     |                     |     |
|-----------------|---------------------|---------------------|-----|
| Ser Val Lys Gly | Ser Cys Ser Glu Pro | Val Ser Phe Thr Thr | His |
| 365             |                     | 370                 | 375 |
| Ser Cys Ala Pro | Glu Cys Pro Phe Pro | Pro Lys Leu Ala His | Arg |
| 380             |                     | 385                 | 390 |
| Ser Lys Ser Ser | Leu Thr Leu Gln Trp | Lys Ala Pro Ile Asp | Asn |
| 395             |                     | 400                 | 405 |
| Gly Ser Lys Ile | Thr Asn Tyr Leu Leu | Glu Trp Asp Glu Gly | Lys |
| 410             |                     | 415                 | 420 |
| Arg Asn Ser Gly | Phe Arg Gln Cys Phe | Phe Gly Ser Gln Lys | His |
| 425             |                     | 430                 | 435 |
| Cys Lys Leu Thr | Lys Leu Cys Pro Ala | Met Gly Tyr Thr Phe | Arg |
| 440             |                     | 445                 | 450 |
| Leu Ala Ala Arg | Asn Asp Ile Gly Thr | Ser Gly Tyr Ser Gln | Glu |
| 455             |                     | 460                 | 465 |
| Val Val Cys Tyr | Thr Leu Gly Asn Ile | Pro Gln Met Pro Ser | Ala |
| 470             |                     | 475                 | 480 |
| Pro Arg Leu Val | Arg Ala Gly Ile Thr | Trp Val Thr Leu Gln | Trp |
| 485             |                     | 490                 | 495 |
| Ser Lys Pro Glu | Gly Cys Ser Pro Glu | Glu Val Ile Thr Tyr | Thr |
| 500             |                     | 505                 | 510 |
| Leu Glu Ile Gln | Glu Asp Glu Asn Asp | Asn Leu Phe His Pro | Lys |
| 515             |                     | 520                 | 525 |
| Tyr Thr Gly Glu | Asp Leu Thr Cys Thr | Val Lys Asn Leu Lys | Arg |
| 530             |                     | 535                 | 540 |
| Ser Thr Gln Tyr | Thr Phe Arg Leu Thr | Ala Ser Asn Thr Glu | Gly |
| 545             |                     | 550                 | 555 |
| Lys Ser Cys Pro | Ser Glu Val Leu Val | Cys Thr Thr Ser Pro | Asp |
| 560             |                     | 565                 | 570 |
| Arg Pro Gly Pro | Pro Thr Arg Pro Leu | Val Lys Gly Pro Val | Thr |
| 575             |                     | 580                 | 585 |
| Ser His Gly Phe | Ser Val Lys Trp Asp | Pro Pro Lys Asp Asn | Gly |
| 590             |                     | 595                 | 600 |
| Gly Ser Glu Ile | Leu Lys Tyr Leu Leu | Glu Ile Thr Asp Gly | Asn |
| 605             |                     | 610                 | 615 |
| Ser Glu Ala Asn | Gln Trp Glu Val Ala | Tyr Ser Gly Ser Ala | Thr |
| 620             |                     | 625                 | 630 |
| Glu Tyr Thr Phe | Thr His Leu Lys Pro | Gly Thr Leu Tyr Lys | Leu |
| 635             |                     | 640                 | 645 |
| Arg Ala Cys Cys | Ile Ser Thr Gly Gly | His Ser Gln Cys Ser | Glu |
| 650             |                     | 655                 | 660 |
| Ser Leu Pro Val | Arg Thr Leu Ser Ile | Ala Pro Gly Gln Cys | Arg |



|                 | 665                 |                     | 670 |  | 675 |
|-----------------|---------------------|---------------------|-----|--|-----|
| Pro Pro Arg Val | Leu Gly Arg Pro Lys | His Lys Glu Val His | Leu |  |     |
|                 | 680                 |                     | 685 |  | 690 |
| Glu Trp Asp Val | Pro Ala Ser Glu Ser | Gly Cys Glu Val Ser | Glu |  |     |
|                 | 695                 |                     | 700 |  | 705 |
| Tyr Ser Val Glu | Met Thr Glu Pro Glu | Asp Val Ala Ser Glu | Val |  |     |
|                 | 710                 |                     | 715 |  | 720 |
| Tyr His Gly Pro | Glu Leu Glu Cys Thr | Val Gly Asn Leu Leu | Pro |  |     |
|                 | 725                 |                     | 730 |  | 735 |
| Gly Thr Val Tyr | Arg Phe Arg Val Arg | Ala Leu Asn Asp Gly | Gly |  |     |
|                 | 740                 |                     | 745 |  | 750 |
| Tyr Gly Pro Tyr | Ser Asp Val Ser Glu | Ile Thr Thr Ala Ala | Gly |  |     |
|                 | 755                 |                     | 760 |  | 765 |
| Pro Pro Gly Gln | Cys Lys Ala Pro Cys | Ile Ser Cys Thr Pro | Asp |  |     |
|                 | 770                 |                     | 775 |  | 780 |
| Gly Cys Val Leu | Val Gly Trp Glu Ser | Pro Asp Ser Ser Gly | Ala |  |     |
|                 | 785                 |                     | 790 |  | 795 |
| Asp Ile Ser Glu | Tyr Arg Leu Glu Trp | Gly Glu Asp Glu Glu | Ser |  |     |
|                 | 800                 |                     | 805 |  | 810 |
| Leu Glu Leu Ile | Tyr His Gly Thr Asp | Thr Arg Phe Glu Ile | Arg |  |     |
|                 | 815                 |                     | 820 |  | 825 |
| Asp Leu Leu Pro | Ala Ala Gln Tyr Cys | Cys Arg Leu Gln Ala | Phe |  |     |
|                 | 830                 |                     | 835 |  | 840 |
| Asn Gln Ala Gly | Ala Gly Pro Tyr Ser | Glu Leu Val Leu Cys | Gln |  |     |
|                 | 845                 |                     | 850 |  | 855 |
| Thr Pro Ala Ser | Ala Pro Asp Pro Val | Ser Thr Leu Cys Val | Leu |  |     |
|                 | 860                 |                     | 865 |  | 870 |
| Glu Glu Glu Pro | Leu Asp Ala Tyr Pro | Asp Ser Pro Ser Ala | Cys |  |     |
|                 | 875                 |                     | 880 |  | 885 |
| Leu Val Leu Asn | Trp Glu Glu Pro Cys | Asn Asn Gly Ser Glu | Ile |  |     |
|                 | 890                 |                     | 895 |  | 900 |
| Leu Ala Tyr Thr | Ile Asp Leu Gly Asp | Thr Ser Ile Thr Val | Gly |  |     |
|                 | 905                 |                     | 910 |  | 915 |
| Asn Thr Thr Met | His Val Met Lys Asp | Leu Leu Pro Glu Thr | Thr |  |     |
|                 | 920                 |                     | 925 |  | 930 |
| Tyr Arg Ile Arg | Ile Gln Ala Ile Asn | Glu Ile Gly Ala Gly | Pro |  |     |
|                 | 935                 |                     | 940 |  | 945 |
| Phe Ser Gln Phe | Ile Lys Ala Lys Thr | Arg Pro Leu Pro Pro | Leu |  |     |
|                 | 950                 |                     | 955 |  | 960 |
| Pro Pro Arg Leu | Glu Cys Ala Ala Ala | Gly Pro Gln Ser Leu | Lys |  |     |
|                 | 965                 |                     | 970 |  | 975 |

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 Ile Val Tyr Thr Leu Gln Leu Glu Asp Arg Asn Lys Arg Phe Ile  
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 Ser Ile Tyr Arg Gly Pro Ser His Thr Tyr Lys Val Gln Arg Leu  
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 Thr Glu Phe Thr Cys Tyr Ser Phe Arg Ile Gln Ala Ala Ser Glu  
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 Ala Gly Glu Gly Pro Phe Ser Glu Thr Tyr Thr Phe Ser Thr Thr  
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 Lys Ser Val Pro Pro Thr Ile Lys Ala Pro Arg Val Thr Gln Leu  
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 Lys Gly Asp Pro Val Asn Tyr Ile Leu Gln Val Leu Val Gly Arg  
                             1085                            1090                            1095  
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                             1100                            1105                            1110  
 Gln Ile Ser Gly Leu Gln Thr Asn Thr Asp Tyr Arg Phe Arg Val  
                             1115                            1120                            1125  
 Cys Ala Cys Arg Arg Cys Leu Asp Thr Ser Gln Glu Leu Ser Gly  
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 Ala Phe Ser Pro Ser Ala Ala Phe Val Leu Gln Arg Ser Glu Val  
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                             1175                            1180                            1185  
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 Phe Leu Met Lys

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<212> DNA

<213> Homo sapien

<400> 101

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<211> 757
<212> PRT
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 20             25             30
Pro Ser Ser Cys Tyr Ala Leu Phe Pro Arg Arg Arg Thr Phe Leu
 35             40             45
Glu Ala Trp Arg Ala Cys Arg Glu Leu Gly Gly Asp Leu Ala Thr
 50             55             60
Pro Arg Thr Pro Glu Glu Ala Gln Arg Val Asp Ser Leu Val Gly
 65             70             75
Ala Gly Pro Ala Ser Arg Leu Leu Trp Ile Gly Leu Gln Arg Gln
 80             85             90

```

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Ala | Arg | Gln | Cys | Gln | Leu | Gln | Arg | Pro | Leu | Arg | Gly | Phe | Thr | Trp |  |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |  |
| Thr | Thr | Gly | Asp | Gln | Asp | Thr | Ala | Phe | Thr | Asn | Trp | Ala | Gln | Pro |  |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |  |
| Ala | Ser | Gly | Gly | Pro | Cys | Pro | Ala | Gln | Arg | Cys | Val | Ala | Leu | Glu |  |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |  |
| Ala | Ser | Gly | Glu | His | Arg | Trp | Leu | Glu | Gly | Ser | Cys | Thr | Leu | Ala |  |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |  |
| Val | Asp | Gly | Tyr | Leu | Cys | Gln | Phe | Gly | Phe | Glu | Gly | Ala | Cys | Pro |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Ala | Leu | Gln | Asp | Glu | Ala | Gly | Gln | Ala | Gly | Pro | Ala | Val | Tyr | Thr |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Thr | Pro | Phe | His | Leu | Val | Ser | Thr | Glu | Phe | Glu | Trp | Leu | Pro | Phe |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Gly | Ser | Val | Ala | Ala | Val | Gln | Cys | Gln | Ala | Gly | Arg | Gly | Ala | Ser |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Leu | Leu | Cys | Val | Lys | Gln | Pro | Glu | Gly | Gly | Val | Gly | Trp | Ser | Arg |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Ala | Gly | Pro | Leu | Cys | Leu | Gly | Thr | Gly | Cys | Ser | Pro | Asp | Asn | Gly |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Gly | Cys | Glu | His | Glu | Cys | Val | Glu | Glu | Val | Asp | Gly | His | Val | Ser |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Cys | Arg | Cys | Thr | Glu | Gly | Phe | Arg | Leu | Ala | Ala | Asp | Gly | Arg | Ser |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Cys | Glu | Asp | Pro | Cys | Ala | Gln | Ala | Pro | Cys | Glu | Gln | Gln | Cys | Glu |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Pro | Gly | Gly | Pro | Gln | Gly | Tyr | Ser | Cys | His | Cys | Arg | Leu | Gly | Phe |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Arg | Pro | Ala | Glu | Asp | Asp | Pro | His | Arg | Cys | Val | Asp | Thr | Asp | Glu |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Cys | Gln | Ile | Ala | Gly | Val | Cys | Gln | Gln | Met | Cys | Val | Asn | Tyr | Val |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Gly | Gly | Phe | Glu | Cys | Tyr | Cys | Ser | Glu | Gly | His | Glu | Leu | Glu | Ala |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Asp | Gly | Ile | Ser | Cys | Ser | Pro | Ala | Gly | Ala | Met | Gly | Ala | Gln | Ala |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Ser | Gln | Asp | Leu | Gly | Asp | Glu | Leu | Leu | Asp | Asp | Gly | Glu | Asp | Glu |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Glu | Asp | Glu | Asp | Glu | Ala | Trp | Lys | Ala | Phe | Asn | Gly | Gly | Trp | Thr |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Glu | Met | Pro | Gly | Ile | Leu | Trp | Met | Glu | Pro | Thr | Gln | Pro | Pro | Asp |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |
| Phe | Ala | Leu | Ala | Tyr | Arg | Pro | Ser | Phe | Pro | Glu | Asp | Arg | Glu | Pro |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |
| Gln | Ile | Pro | Tyr | Pro | Glu | Pro | Thr | Trp | Pro | Pro | Pro | Leu | Ser | Ala |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |
| Pro | Arg | Val | Pro | Tyr | His | Ser | Ser | Val | Leu | Ser | Val | Thr | Arg | Pro |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |
| Val | Val | Val | Ser | Ala | Thr | His | Pro | Thr | Leu | Pro | Ser | Ala | His | Gln |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |
| Pro | Pro | Val | Ile | Pro | Ala | Thr | His | Pro | Ala | Leu | Ser | Arg | Asp | His |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |
| Gln | Ile | Pro | Val | Ile | Ala | Ala | Asn | Tyr | Pro | Asp | Leu | Pro | Ser | Ala |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |
| Tyr | Gln | Pro | Gly | Ile | Leu | Ser | Val | Ser | His | Ser | Ala | Gln | Pro | Pro |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |
| Ala | His | Gln | Pro | Pro | Met | Ile | Ser | Thr | Lys | Tyr | Pro | Glu | Leu | Phe |
|     |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |
| Pro | Ala | His | Gln | Ser | Pro | Met | Phe | Pro | Asp | Thr | Arg | Val | Ala | Gly |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |
| Thr | Gln | Thr | Thr | Thr | His | Leu | Pro | Gly | Ile | Pro | Pro | Asn | His | Ala |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |
| Pro | Leu | Val | Thr | Thr | Leu | Gly | Ala | Gln | Leu | Pro | Pro | Gln | Ala | Pro |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |
| Asp | Ala | Leu | Val | Leu | Arg | Thr | Gln | Ala | Thr | Gln | Leu | Pro | Ile | Ile |
|     |     |     |     | 575 |     |     |     |     | 580 |     |     |     |     | 585 |
| Pro | Thr | Ala | Gln | Pro | Ser | Leu | Thr | Thr | Thr | Ser | Arg | Ser | Pro | Val |
|     |     |     |     | 590 |     |     |     |     | 595 |     |     |     |     | 600 |
| Ser | Pro | Ala | His | Gln | Ile | Ser | Val | Pro | Ala | Ala | Thr | Gln | Pro | Ala |
|     |     |     |     | 605 |     |     |     |     | 610 |     |     |     |     | 615 |
| Ala | Leu | Pro | Thr | Leu | Leu | Pro | Ser | Gln | Ser | Pro | Thr | Asn | Gln | Thr |
|     |     |     |     | 620 |     |     |     |     | 625 |     |     |     |     | 630 |
| Ser | Pro | Ile | Ser | Pro | Thr | His | Pro | His | Ser | Lys | Ala | Pro | Gln | Ile |
|     |     |     |     | 635 |     |     |     |     | 640 |     |     |     |     | 645 |
| Pro | Arg | Glu | Asp | Gly | Pro | Ser | Pro | Lys | Leu | Ala | Leu | Trp | Leu | Pro |
|     |     |     |     | 650 |     |     |     |     | 655 |     |     |     |     | 660 |
| Ser | Pro | Ala | Pro | Thr | Ala | Ala | Pro | Thr | Ala | Leu | Gly | Glu | Ala | Gly |
|     |     |     |     | 665 |     |     |     |     | 670 |     |     |     |     | 675 |
| Leu | Ala | Glu | His | Ser | Gln | Arg | Asp | Asp | Arg | Trp | Leu | Leu | Val | Ala |
|     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |     | 690 |
| Leu | Leu | Val | Pro | Thr | Cys | Val | Phe | Leu | Val | Val | Leu | Leu | Ala | Leu |
|     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     | 705 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ile | Val | Tyr | Cys | Thr | Arg | Cys | Gly | Pro | His | Ala | Pro | Asn | Lys |
|     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |
| Arg | Ile | Thr | Asp | Cys | Tyr | Arg | Trp | Val | Ile | His | Ala | Gly | Ser | Lys |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |
| Ser | Pro | Thr | Glu | Pro | Met | Pro | Pro | Arg | Gly | Ser | Leu | Thr | Gly | Val |
|     |     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |
| Gln | Thr | Cys | Arg | Thr | Ser | Val |     |     |     |     |     |     |     |     |
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<211> 496

<212> PRT

<213> Homo sapien

<400> 104

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Lys | Gln | Tyr | Gln | Val | Gln | His | Gly | Ser | Cys | Ser | Tyr | Thr | Phe | 35  | 40  | 45  |
| Leu | Leu | Pro | Glu | Met | Asp | Asn | Cys | Arg | Ser | Ser | Ser | Ser | Pro | Tyr | 50  | 55  | 60  |
| Val | Ser | Asn | Ala | Val | Gln | Arg | Asp | Ala | Pro | Leu | Glu | Tyr | Asp | Asp | 65  | 70  | 75  |
| Ser | Val | Gln | Arg | Leu | Gln | Val | Leu | Glu | Asn | Ile | Met | Glu | Asn | Asn | 80  | 85  | 90  |
| Thr | Gln | Trp | Leu | Met | Lys | Leu | Glu | Asn | Tyr | Ile | Gln | Asp | Asn | Met | 95  | 100 | 105 |
| Lys | Lys | Glu | Met | Val | Glu | Ile | Gln | Gln | Asn | Ala | Val | Gln | Asn | Gln | 110 | 115 | 120 |
| Thr | Ala | Val | Met | Ile | Glu | Ile | Gly | Thr | Asn | Leu | Leu | Asn | Gln | Thr | 125 | 130 | 135 |
| Ala | Glu | Gln | Thr | Arg | Lys | Leu | Thr | Asp | Val | Glu | Ala | Gln | Val | Leu | 140 | 145 | 150 |
| Asn | Gln | Thr | Thr | Arg | Leu | Glu | Leu | Gln | Leu | Leu | Glu | His | Ser | Leu | 155 | 160 | 165 |
| Ser | Thr | Asn | Lys | Leu | Glu | Lys | Gln | Ile | Leu | Asp | Gln | Thr | Ser | Glu | 170 | 175 | 180 |
| Ile | Asn | Lys | Leu | Gln | Asp | Lys | Asn | Ser | Phe | Leu | Glu | Lys | Lys | Val | 185 | 190 | 195 |
| Leu | Ala | Met | Glu | Asp | Lys | His | Ile | Ile | Gln | Leu | Gln | Ser | Ile | Lys | 200 | 205 | 210 |
| Glu | Glu | Lys | Asp | Gln | Leu | Gln | Val | Leu | Val | Ser | Lys | Gln | Asn | Ser | 215 | 220 | 225 |
| Ile | Ile | Glu | Glu | Leu | Glu | Lys | Lys | Ile | Val | Thr | Ala | Thr | Val | Asn | 230 | 235 | 240 |
| Asn | Ser | Val | Leu | Gln | Lys | Gln | Gln | His | Asp | Leu | Met | Glu | Thr | Val | 245 | 250 | 255 |
| Asn | Asn | Leu | Leu | Thr | Met | Met | Ser | Thr | Ser | Asn | Ser | Ala | Lys | Asp | 260 | 265 | 270 |
| Pro | Thr | Val | Ala | Lys | Glu | Glu | Gln | Ile | Ser | Phe | Arg | Asp | Cys | Ala | 275 | 280 | 285 |
| Glu | Val | Phe | Lys | Ser | Gly | His | Thr | Thr | Asn | Gly | Ile | Tyr | Thr | Leu | 290 | 295 | 300 |
| Thr | Phe | Pro | Asn | Ser | Thr | Glu | Glu | Ile | Lys | Ala | Tyr | Cys | Asp | Met | 305 | 310 | 315 |
| Glu | Ala | Gly | Gly | Gly | Gly | Trp | Thr | Ile | Ile | Gln | Arg | Arg | Glu | Asp | 320 | 325 | 330 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ser | Val | Asp | Phe | Gln | Arg | Thr | Trp | Lys | Glu | Tyr | Lys | Val | Gly | 335 | 340 | 345 |
| Phe | Gly | Asn | Pro | Ser | Gly | Glu | Tyr | Trp | Leu | Gly | Asn | Glu | Phe | Val | 350 | 355 | 360 |
| Ser | Gln | Leu | Thr | Asn | Gln | Gln | Arg | Tyr | Val | Leu | Lys | Ile | His | Leu | 365 | 370 | 375 |
| Lys | Asp | Trp | Glu | Gly | Asn | Glu | Ala | Tyr | Ser | Leu | Tyr | Glu | His | Phe | 380 | 385 | 390 |
| Tyr | Leu | Ser | Ser | Glu | Glu | Leu | Asn | Tyr | Arg | Ile | His | Leu | Lys | Gly | 395 | 400 | 405 |
| Leu | Thr | Gly | Thr | Ala | Gly | Lys | Ile | Ser | Ser | Ile | Ser | Gln | Pro | Gly | 410 | 415 | 420 |
| Asn | Asp | Phe | Ser | Thr | Lys | Asp | Gly | Asp | Asn | Asp | Lys | Cys | Ile | Cys | 425 | 430 | 435 |
| Lys | Cys | Ser | Gln | Met | Leu | Thr | Gly | Gly | Trp | Trp | Phe | Asp | Ala | Cys | 440 | 445 | 450 |
| Gly | Pro | Ser | Asn | Leu | Asn | Gly | Met | Tyr | Tyr | Pro | Gln | Arg | Gln | Asn | 455 | 460 | 465 |
| Thr | Asn | Lys | Phe | Asn | Gly | Ile | Lys | Trp | Tyr | Tyr | Trp | Lys | Gly | Ser | 470 | 475 | 480 |
| Gly | Tyr | Ser | Leu | Lys | Ala | Thr | Thr | Met | Met | Ile | Arg | Pro | Ala | Asp | 485 | 490 | 495 |

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<210> 106

<211> 419

<212> PRT

<213> Homo sapien

<400> 106

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| Met | His | Leu | Leu | Gly | Phe | Phe | Ser | Val | Ala | Cys | Ser | Leu | Leu | Ala |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ala | Leu | Leu | Pro | Gly | Pro | Arg | Glu | Ala | Pro | Ala | Ala | Ala | Ala |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Phe | Glu | Ser | Gly | Leu | Asp | Leu | Ser | Asp | Ala | Glu | Pro | Asp | Ala |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Glu | Ala | Thr | Ala | Tyr | Ala | Ser | Lys | Asp | Leu | Glu | Glu | Gln | Leu |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Ser | Val | Ser | Ser | Val | Asp | Glu | Leu | Met | Thr | Val | Leu | Tyr | Pro |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Tyr | Trp | Lys | Met | Tyr | Lys | Cys | Gln | Leu | Arg | Lys | Gly | Gly | Trp |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | His | Asn | Arg | Glu | Gln | Ala | Asn | Leu | Asn | Ser | Arg | Thr | Glu | Glu |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Thr | Ile | Lys | Phe | Ala | Ala | Ala | His | Tyr | Asn | Thr | Glu | Ile | Leu | Lys |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Ile | Asp | Asn | Glu | Trp | Arg | Lys | Thr | Gln | Cys | Met | Pro | Arg | Glu |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Cys | Ile | Asp | Val | Gly | Lys | Glu | Phe | Gly | Val | Ala | Thr | Asn | Thr |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Phe | Phe | Lys | Pro | Pro | Cys | Val | Ser | Val | Tyr | Arg | Cys | Gly | Gly | Cys |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Asn | Ser | Glu | Gly | Leu | Gln | Cys | Met | Asn | Thr | Ser | Thr | Ser | Tyr |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Ser | Lys | Thr | Leu | Phe | Glu | Ile | Thr | Val | Pro | Leu | Ser | Gln | Gly |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Lys | Pro | Val | Thr | Ile | Ser | Phe | Ala | Asn | His | Thr | Ser | Cys | Arg |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Met | Ser | Lys | Leu | Asp | Val | Tyr | Arg | Gln | Val | His | Ser | Ile | Ile |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Arg | Ser | Leu | Pro | Ala | Thr | Leu | Pro | Gln | Cys | Gln | Ala | Ala | Asn |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Thr | Cys | Pro | Thr | Asn | Tyr | Met | Trp | Asn | Asn | His | Ile | Cys | Arg |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Cys | Leu | Ala | Gln | Glu | Asp | Phe | Met | Phe | Ser | Ser | Asp | Ala | Gly | Asp |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Asp | Ser | Thr | Asp | Gly | Phe | His | Asp | Ile | Cys | Gly | Pro | Asn | Lys | Glu |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Leu | Asp | Glu | Glu | Thr | Cys | Gln | Cys | Val | Cys | Arg | Ala | Gly | Leu | Arg |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Pro | Ala | Ser | Cys | Gly | Pro | His | Lys | Glu | Leu | Asp | Arg | Asn | Ser | Cys |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Gln | Cys | Val | Cys | Lys | Asn | Lys | Leu | Phe | Pro | Ser | Gln | Cys | Gly | Ala |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Asn | Arg | Glu | Phe | Asp | Glu | Asn | Thr | Cys | Gln | Cys | Val | Cys | Lys | Arg |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Thr | Cys | Pro | Arg | Asn | Gln | Pro | Leu | Asn | Pro | Gly | Lys | Cys | Ala | Cys |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Glu | Cys | Thr | Glu | Ser | Pro | Gln | Lys | Cys | Leu | Leu | Lys | Gly | Lys | Lys |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Phe | His | His | Gln | Thr | Cys | Ser | Cys | Tyr | Arg | Arg | Pro | Cys | Thr | Asn |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Arg | Gln | Lys | Ala | Cys | Glu | Pro | Gly | Phe | Ser | Tyr | Ser | Glu | Glu | Val |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Cys | Arg | Cys | Val | Pro | Ser | Tyr | Trp | Lys | Arg | Pro | Gln | Met | Ser |     |  |
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<400> 107

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| Met | Asp | Ala | Met | Lys | Arg | Gly | Leu | Cys | Cys | Val | Leu | Leu | Leu | Cys |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |
| Gly | Ala | Val | Phe | Val | Ser | Pro | Ser | Gln | Glu | Ile | His | Ala | Arg | Phe |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Arg | Arg | Gly | Ala | Arg | Ser | Tyr | Gln | Val | Ile | Cys | Arg | Asp | Glu | Lys |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Thr | Gln | Met | Ile | Tyr | Gln | Gln | His | Gln | Ser | Trp | Leu | Arg | Pro | Val |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Leu | Arg | Ser | Asn | Arg | Val | Glu | Tyr | Cys | Trp | Cys | Asn | Ser | Gly | Arg |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Ala | Gln | Cys | His | Ser | Val | Pro | Val | Lys | Ser | Cys | Ser | Glu | Pro | Arg |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Cys | Phe | Asn | Gly | Gly | Thr | Cys | Gln | Gln | Ala | Leu | Tyr | Phe | Ser | Asp |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Phe | Val | Cys | Gln | Cys | Pro | Glu | Gly | Phe | Ala | Gly | Lys | Cys | Cys | Glu |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| Ile | Asp | Thr | Arg | Ala | Thr | Cys | Tyr | Glu | Asp | Gln | Gly | Ile | Ser | Tyr |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Arg | Gly | Thr | Trp | Ser | Thr | Ala | Glu | Ser | Gly | Ala | Glu | Cys | Thr | Asn |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Trp | Asn | Ser | Ser | Ala | Leu | Ala | Gln | Lys | Pro | Tyr | Ser | Gly | Arg | Arg |  |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |  |
| Pro | Asp | Ala | Ile | Arg | Leu | Gly | Leu | Gly | Asn | His | Asn | Tyr | Cys | Arg |  |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |  |
| Asn | Pro | Asp | Arg | Asp | Ser | Lys | Pro | Trp | Cys | Tyr | Val | Phe | Lys | Ala |  |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |  |
| Gly | Lys | Tyr | Ser | Ser | Glu | Phe | Cys | Ser | Thr | Pro | Ala | Cys | Ser | Glu |  |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |  |
| Gly | Asn | Ser | Asp | Cys | Tyr | Phe | Gly | Asn | Gly | Ser | Ala | Tyr | Arg | Gly |  |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |  |
| Thr | His | Ser | Leu | Thr | Glu | Ser | Gly | Ala | Ser | Cys | Leu | Pro | Trp | Asn |  |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Ser | Met | Ile | Leu | Ile | Gly | Lys | Val | Tyr | Thr | Ala | Gln | Asn | Pro | Ser |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Ala | Gln | Ala | Leu | Gly | Leu | Gly | Lys | His | Asn | Tyr | Cys | Arg | Asn | Pro |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Asp | Gly | Asp | Ala | Lys | Pro | Trp | Cys | His | Val | Leu | Lys | Asn | Arg | Arg |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Leu | Thr | Trp | Glu | Tyr | Cys | Asp | Val | Pro | Ser | Cys | Ser | Thr | Cys | Gly |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Leu | Arg | Gln | Tyr | Ser | Gln | Pro | Gln | Phe | Arg | Ile | Lys | Gly | Gly | Leu |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Phe | Ala | Asp | Ile | Ala | Ser | His | Pro | Trp | Gln | Ala | Ala | Ile | Phe | Ala |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Lys | His | Arg | Arg | Ser | Pro | Gly | Glu | Arg | Phe | Leu | Cys | Gly | Gly | Ile |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Leu | Ile | Ser | Ser | Cys | Trp | Ile | Leu | Ser | Ala | Ala | His | Cys | Phe | Gln |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Glu | Arg | Phe | Pro | Pro | His | His | Leu | Thr | Val | Ile | Leu | Gly | Arg | Thr |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Tyr | Arg | Val | Val | Pro | Gly | Glu | Glu | Glu | Gln | Lys | Phe | Glu | Val | Glu |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Lys | Tyr | Ile | Val | His | Lys | Glu | Phe | Asp | Asp | Asp | Thr | Tyr | Asp | Asn |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Asp | Ile | Ala | Leu | Leu | Gln | Leu | Lys | Ser | Asp | Ser | Ser | Arg | Cys | Ala |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |
| Gln | Glu | Ser | Ser | Val | Val | Arg | Thr | Val | Cys | Leu | Pro | Pro | Ala | Asp |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |
| Leu | Gln | Leu | Pro | Asp | Trp | Thr | Glu | Cys | Glu | Leu | Ser | Gly | Tyr | Gly |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |
| Lys | His | Glu | Ala | Leu | Ser | Pro | Phe | Tyr | Ser | Glu | Arg | Leu | Lys | Glu |  |



|                 |                     |                         |     |     |     |
|-----------------|---------------------|-------------------------|-----|-----|-----|
|                 | 455                 |                         | 460 |     | 465 |
| Ala His Val Arg | Leu Tyr Pro Ser Ser | Arg Cys Thr Ser Gln His |     |     |     |
|                 | 470                 | 475                     |     | 480 |     |
| Leu Leu Asn Arg | Thr Val Thr Asp Asn | Met Leu Cys Ala Gly Asp |     |     |     |
|                 | 485                 | 490                     |     | 495 |     |
| Thr Arg Ser Gly | Gly Pro Gln Ala Asn | Leu His Asp Ala Cys Gln |     |     |     |
|                 | 500                 | 505                     |     | 510 |     |
| Gly Asp Ser Gly | Gly Pro Leu Val Cys | Leu Asn Asp Gly Arg Met |     |     |     |
|                 | 515                 | 520                     |     | 525 |     |
| Thr Leu Val Gly | Ile Ile Ser Trp Gly | Leu Gly Cys Gly Gln Lys |     |     |     |
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| Asp Val Pro Gly | Val Tyr Thr Lys Val | Thr Asn Tyr Leu Asp Trp |     |     |     |
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<400> 110

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| Met | Leu | Gly | Val | Leu | Val | Leu | Gly | Ala | Leu | Ala | Leu | Ala | Gly | Leu |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |
| Gly | Phe | Pro | Ala | Pro | Ala | Glu | Pro | Gln | Pro | Gly | Gly | Ser | Gln | Cys |
|     |     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |
| Val | Glu | His | Asp | Cys | Phe | Ala | Leu | Tyr | Pro | Gly | Pro | Ala | Thr | Phe |
|     |     |     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |
| Leu | Asn | Ala | Ser | Gln | Ile | Cys | Asp | Gly | Leu | Arg | Gly | His | Leu | Met |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |
| Thr | Val | Arg | Ser | Ser | Val | Ala | Ala | Asp | Val | Ile | Ser | Leu | Leu | Leu |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |
| Asn | Gly | Asp | Gly | Gly | Val | Gly | Arg | Arg | Arg | Leu | Trp | Ile | Gly | Leu |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Gln | Leu | Pro | Pro | Gly | Cys | Gly | Asp | Pro | Lys | Arg | Leu | Gly | Pro | Leu |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Arg | Gly | Phe | Gln | Trp | Val | Thr | Gly | Asp | Asn | Asn | Thr | Ser | Tyr | Ser |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| Arg | Trp | Ala | Arg | Leu | Asp | Leu | Asn | Gly | Ala | Pro | Leu | Cys | Gly | Pro |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Leu | Cys | Val | Ala | Val | Ser | Ala | Ala | Glu | Ala | Thr | Val | Pro | Ser | Glu |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Pro | Ile | Trp | Glu | Glu | Gln | Gln | Cys | Glu | Val | Lys | Ala | Asp | Gly | Phe |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Leu | Cys | Glu | Phe | His | Phe | Pro | Ala | Thr | Cys | Arg | Pro | Leu | Ala | Val |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Glu | Pro | Gly | Ala | Ala | Ala | Ala | Ala | Val | Ser | Ile | Thr | Tyr | Gly | Thr |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Pro | Phe | Ala | Ala | Arg | Gly | Ala | Asp | Phe | Gln | Ala | Leu | Pro | Val | Gly |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Ser | Ser | Ala | Ala | Val | Ala | Pro | Leu | Gly | Leu | Gln | Leu | Met | Cys | Thr |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Ala | Pro | Pro | Gly | Ala | Val | Gln | Gly | His | Trp | Ala | Arg | Glu | Ala | Pro |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Gly | Ala | Trp | Asp | Cys | Ser | Val | Glu | Asn | Gly | Gly | Cys | Glu | His | Ala |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |  |
| Cys | Asn | Ala | Ile | Pro | Gly | Ala | Pro | Arg | Cys | Gln | Cys | Pro | Ala | Gly |  |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |  |
| Ala | Ala | Leu | Gln | Ala | Asp | Gly | Arg | Ser | Cys | Thr | Ala | Ser | Ala | Thr |  |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |  |
| Gln | Ser | Cys | Asn | Asp | Leu | Cys | Glu | His | Phe | Cys | Val | Pro | Asn | Pro |  |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |  |
| Asp | Gln | Pro | Gly | Ser | Tyr | Ser | Cys | Met | Cys | Glu | Thr | Gly | Tyr | Arg |  |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |  |
| Leu | Ala | Ala | Asp | Gln | His | Arg | Cys | Glu | Asp | Val | Asp | Asp | Cys | Ile |  |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |  |
| Leu | Glu | Pro | Ser | Pro | Cys | Pro | Gln | Arg | Cys | Val | Asn | Thr | Gln | Gly |  |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |  |
| Gly | Phe | Glu | Cys | His | Cys | Tyr | Pro | Asn | Tyr | Asp | Leu | Val | Asp | Gly |  |
|     |     |     |     | 350 |     |     |     |     | 355 |     |     |     |     | 360 |  |
| Glu | Cys | Val | Glu | Pro | Val | Asp | Pro | Cys | Phe | Arg | Ala | Asn | Cys | Glu |  |
|     |     |     |     | 365 |     |     |     |     | 370 |     |     |     |     | 375 |  |
| Tyr | Gln | Cys | Gln | Pro | Leu | Asn | Gln | Thr | Ser | Tyr | Leu | Cys | Val | Cys |  |
|     |     |     |     | 380 |     |     |     |     | 385 |     |     |     |     | 390 |  |
| Ala | Glu | Gly | Phe | Ala | Pro | Ile | Pro | His | Glu | Pro | His | Arg | Cys | Gln |  |
|     |     |     |     | 395 |     |     |     |     | 400 |     |     |     |     | 405 |  |
| Met | Phe | Cys | Asn | Gln | Thr | Ala | Cys | Pro | Ala | Asp | Cys | Asp | Pro | Asn |  |
|     |     |     |     | 410 |     |     |     |     | 415 |     |     |     |     | 420 |  |
| Thr | Gln | Ala | Ser | Cys | Glu | Cys | Pro | Glu | Gly | Tyr | Ile | Leu | Asp | Asp |  |
|     |     |     |     | 425 |     |     |     |     | 430 |     |     |     |     | 435 |  |
| Gly | Phe | Ile | Cys | Thr | Asp | Ile | Asp | Glu | Cys | Glu | Asn | Gly | Gly | Phe |  |
|     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |     | 450 |  |
| Cys | Ser | Gly | Val | Cys | His | Asn | Leu | Pro | Gly | Thr | Phe | Glu | Cys | Ile |  |
|     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     | 465 |  |
| Cys | Gly | Pro | Asp | Ser | Ala | Leu | Ala | Arg | His | Ile | Gly | Thr | Asp | Cys |  |
|     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |  |
| Asp | Ser | Gly | Lys | Val | Asp | Gly | Gly | Asp | Ser | Gly | Ser | Gly | Glu | Pro |  |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |  |
| Pro | Pro | Ser | Pro | Thr | Pro | Gly | Ser | Thr | Leu | Thr | Pro | Pro | Ala | Val |  |
|     |     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |  |
| Gly | Leu | Val | His | Ser | Gly | Leu | Leu | Ile | Gly | Ile | Ser | Ile | Ala | Ser |  |
|     |     |     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |  |
| Leu | Cys | Leu | Val | Val | Ala | Leu | Leu | Ala | Leu | Leu | Cys | His | Leu | Arg |  |
|     |     |     |     | 530 |     |     |     |     | 535 |     |     |     |     | 540 |  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Lys | Gln | Gly | Ala | Ala | Arg | Ala | Lys | Met | Glu | Tyr | Lys | Cys | Ala |
|     |     |     |     | 545 |     |     |     |     | 550 |     |     |     |     | 555 |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Ala | Pro | Ser | Lys | Glu | Val | Val | Leu | Gln | His | Val | Arg | Thr | Glu | Arg |
|     |     |     |     | 560 |     |     |     |     | 565 |     |     |     |     | 570 |
|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| Thr | Pro | Gln | Arg | Leu |     |     |     |     |     |     |     |     |     |     |
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<212> PRT

<213> Homo sapien

<400> 112

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Thr | Pro | Ala | Trp | Pro | Arg | Val | Pro | Arg | Pro | Glu | Thr | Ala |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ala | Arg | Thr | Leu | Leu | Leu | Gly | Trp | Val | Phe | Ala | Gln | Val | Ala |
|     |     |     |     | 20  |     |     |     | 25  |     |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Ala | Ser | Gly | Thr | Thr | Asn | Thr | Val | Ala | Ala | Tyr | Asn | Leu | Thr |
|     |     |     |     | 35  |     |     |     | 40  |     |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Trp | Lys | Ser | Thr | Asn | Phe | Lys | Thr | Ile | Leu | Glu | Trp | Glu | Pro | Lys |
|     |     |     |     | 50  |     |     |     | 55  |     |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Val | Asn | Gln | Val | Tyr | Thr | Val | Gln | Ile | Ser | Thr | Lys | Ser | Gly |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Trp | Lys | Ser | Lys | Cys | Phe | Tyr | Thr | Thr | Asp | Thr | Glu | Cys | Asp |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |
| Leu | Thr | Asp | Glu | Ile | Val | Lys | Asp | Val | Lys | Gln | Thr | Tyr | Leu | Ala |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Arg | Val | Phe | Ser | Tyr | Pro | Ala | Gly | Asn | Val | Glu | Ser | Thr | Gly | Ser |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| Ala | Gly | Glu | Pro | Leu | Tyr | Glu | Asn | Ser | Pro | Glu | Phe | Thr | Pro | Tyr |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Leu | Glu | Thr | Asn | Leu | Gly | Gln | Pro | Thr | Ile | Gln | Ser | Phe | Glu | Gln |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Val | Gly | Thr | Lys | Val | Asn | Val | Thr | Val | Glu | Asp | Glu | Arg | Thr | Leu |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Val | Arg | Arg | Asn | Asn | Thr | Phe | Leu | Ser | Leu | Arg | Asp | Val | Phe | Gly |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Lys | Asp | Leu | Ile | Tyr | Thr | Leu | Tyr | Tyr | Trp | Lys | Ser | Ser | Ser | Ser |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Gly | Lys | Lys | Thr | Ala | Lys | Thr | Asn | Thr | Asn | Glu | Phe | Leu | Ile | Asp |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Val | Asp | Lys | Gly | Glu | Asn | Tyr | Cys | Phe | Ser | Val | Gln | Ala | Val | Ile |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Pro | Ser | Arg | Thr | Val | Asn | Arg | Lys | Ser | Thr | Asp | Ser | Pro | Val | Glu |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Cys | Met | Gly | Gln | Glu | Lys | Gly | Glu | Phe | Arg | Glu | Ile | Phe | Tyr | Ile |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Ile | Gly | Ala | Val | Val | Phe | Val | Val | Ile | Ile | Leu | Val | Ile | Ile | Leu |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| Ala | Ile | Ser | Leu | His | Lys | Cys | Arg | Lys | Ala | Gly | Val | Gly | Gln | Ser |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Trp | Lys | Glu | Asn | Ser | Pro | Leu | Asn | Val | Ser |     |     |     |     |     |
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Val Gln Gln Arg Asn Glu Leu Gly Val Tyr Leu Met Asn Leu Ser  
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Ile Ala Asp Leu Leu Tyr Ile Cys Thr Leu Pro Leu Trp Val Asp  
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Tyr Phe Leu His His Asp Asn Trp Ile His Gly Pro Gly Ser Cys

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Leu | Phe | Gly | Phe | Ile | Phe | Tyr | Thr | Asn | Ile | Tyr | Ile | Ser | Ile |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |
| Ala | Phe | Leu | Cys | Cys | Ile | Ser | Val | Asp | Arg | Tyr | Leu | Ala | Val | Ala |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |
| His | Pro | Leu | Arg | Phe | Ala | Arg | Leu | Arg | Arg | Val | Lys | Thr | Ala | Val |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |
| Ala | Val | Ser | Ser | Val | Val | Trp | Ala | Thr | Glu | Leu | Gly | Ala | Asn | Ser |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |
| Ala | Pro | Leu | Phe | His | Asp | Glu | Leu | Phe | Arg | Asp | Arg | Tyr | Asn | His |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |
| Thr | Phe | Cys | Phe | Glu | Lys | Phe | Pro | Met | Glu | Gly | Trp | Val | Ala | Trp |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |
| Met | Asn | Leu | Tyr | Arg | Val | Phe | Val | Gly | Phe | Leu | Phe | Pro | Trp | Ala |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |
| Leu | Met | Leu | Leu | Ser | Tyr | Arg | Gly | Ile | Leu | Arg | Ala | Val | Arg | Gly |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |
| Ser | Val | Ser | Thr | Glu | Arg | Gln | Glu | Lys | Ala | Lys | Ile | Lys | Arg | Leu |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |
| Ala | Leu | Ser | Leu | Ile | Ala | Ile | Val | Leu | Val | Cys | Phe | Ala | Pro | Tyr |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| His | Val | Leu | Leu | Leu | Ser | Arg | Ser | Ala | Ile | Tyr | Leu | Gly | Arg | Pro |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |
| Trp | Asp | Cys | Gly | Phe | Glu | Glu | Arg | Val | Phe | Ser | Ala | Tyr | His | Ser |
|     |     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |
| Ser | Leu | Ala | Phe | Thr | Ser | Leu | Asn | Cys | Val | Ala | Asp | Pro | Ile | Leu |
|     |     |     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |
| Tyr | Cys | Leu | Val | Asn | Glu | Gly | Ala | Arg | Ser | Asp | Val | Ala | Lys | Ala |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |
| Leu | His | Asn | Leu | Leu | Arg | Phe | Leu | Ala | Ser | Asp | Lys | Pro | Gln | Glu |
|     |     |     |     | 305 |     |     |     |     | 310 |     |     |     |     | 315 |
| Met | Ala | Asn | Ala | Ser | Leu | Thr | Leu | Glu | Thr | Pro | Leu | Thr | Ser | Lys |
|     |     |     |     | 320 |     |     |     |     | 325 |     |     |     |     | 330 |
| Arg | Asn | Ser | Thr | Ala | Lys | Ala | Met | Thr | Gly | Ser | Trp | Ala | Ala | Thr |
|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |
| Pro | Pro | Ser | Gln | Gly | Asp | Gln | Val | Gln | Leu | Lys | Met | Leu | Pro | Pro |
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Ala Gln

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<212> DNA  
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<400> 115

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| Gly | Arg | Gly | Ser | Ala | Ala | Ala | Arg | Ser | Arg | Tyr | Thr | Cys | Arg | Leu |
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| Gln | Gln | His | Asp | Arg | Gly | Arg | Arg | Gln | Val | Thr | Lys | Met | Leu | Phe |
|     |     |     |     | 290 |     |     |     |     | 295 |     |     |     |     | 300 |
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|     |     |     |     | 335 |     |     |     |     | 340 |     |     |     |     | 345 |
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| Ser Ile Gly Tyr | Ile Ala Asp Arg Phe | Gly Arg Lys Leu Cys Leu |     |  |     |
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| Leu Thr Thr Val | Leu Ile Asn Ala Ala | Ala Gly Val Leu Met Ala |     |  |     |
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| Ala Phe Met Ile | Ile Leu Thr Ile Asp | Arg Ile Gly Arg Arg Tyr |     |  |     |
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| Ser Val Phe Ile | Pro Gly Asp Leu Gln Trp Leu Lys Ile Ile Ile |         |
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| Ser Cys Leu Gly | Arg Met Gly Ile Thr Met Ala Tyr Glu Ile Val |         |
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| Cys Leu Val Asn | Ala Glu Leu Tyr Pro Thr Phe Ile Arg Asn Leu |         |
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| Gly Val His Ile | Cys Ser Ser Met Cys Asp Ile Gly Gly Ile Ile |         |
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| Thr Pro Phe Leu | Val Tyr Arg Leu Thr Asn Ile Trp Leu Glu Leu |         |
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| Ile Glu Glu Ala | Glu Asn Met Gln Arg Pro Arg Lys Asn Lys Glu |         |
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<212> DNA

<213> Homo sapien

<400> 119

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 Leu Gln Lys Ile Asn Thr Arg Leu Gly Gln Gly Val Pro Leu Val  
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 Glu Tyr Leu Gln Glu Glu Pro Pro Ile Pro Val Val Ile Cys Asp  
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 Gly Ser Gly Arg Ala Ser Asp Ile Leu Ser Phe Ala His Lys Tyr  
 215 220 225

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Glu | Glu | Gly | Gly | Ile | Ile | Asn | Glu | Ser | Leu | Arg | Glu | Gln | Leu | 230 | 235 | 240 |
| Leu | Val | Thr | Ile | Gln | Lys | Thr | Phe | Asn | Tyr | Asn | Lys | Ala | Gln | Ser | 245 | 250 | 255 |
| His | Gln | Leu | Phe | Ala | Ile | Ile | Met | Glu | Cys | Met | Lys | Lys | Lys | Glu | 260 | 265 | 270 |
| Leu | Val | Thr | Val | Phe | Arg | Met | Gly | Ser | Glu | Gly | Gln | Gln | Asp | Ile | 275 | 280 | 285 |
| Glu | Met | Ala | Ile | Leu | Thr | Ala | Leu | Leu | Lys | Gly | Thr | Asn | Val | Ser | 290 | 295 | 300 |
| Ala | Pro | Asp | Gln | Leu | Ser | Leu | Ala | Leu | Ala | Trp | Asn | Arg | Val | Asp | 305 | 310 | 315 |
| Ile | Ala | Arg | Ser | Gln | Ile | Phe | Val | Phe | Gly | Pro | His | Trp | Pro | Pro | 320 | 325 | 330 |
| Leu | Gly | Ser | Leu | Ala | Pro | Pro | Thr | Asp | Ser | Lys | Ala | Thr | Glu | Lys | 335 | 340 | 345 |
| Glu | Lys | Lys | Pro | Pro | Met | Ala | Thr | Thr | Lys | Gly | Gly | Arg | Gly | Lys | 350 | 355 | 360 |
| Gly | Lys | Gly | Lys | Lys | Lys | Gly | Lys | Val | Lys | Glu | Glu | Val | Glu | Glu | 365 | 370 | 375 |
| Glu | Thr | Asp | Pro | Arg | Lys | Ile | Glu | Leu | Leu | Asn | Trp | Val | Asn | Ala | 380 | 385 | 390 |
| Leu | Glu | Gln | Ala | Met | Leu | Asp | Ala | Leu | Val | Leu | Asp | Arg | Val | Asp | 395 | 400 | 405 |
| Phe | Val | Lys | Leu | Leu | Ile | Glu | Asn | Gly | Val | Asn | Met | Gln | His | Phe | 410 | 415 | 420 |
| Leu | Thr | Ile | Pro | Arg | Leu | Glu | Glu | Leu | Tyr | Asn | Thr | Arg | Leu | Gly | 425 | 430 | 435 |
| Pro | Pro | Asn | Thr | Leu | His | Leu | Leu | Val | Arg | Asp | Val | Lys | Lys | Ser | 440 | 445 | 450 |
| Asn | Leu | Pro | Pro | Asp | Tyr | His | Ile | Ser | Leu | Ile | Asp | Ile | Gly | Leu | 455 | 460 | 465 |
| Val | Leu | Glu | Tyr | Leu | Met | Gly | Gly | Ala | Tyr | Arg | Cys | Asn | Tyr | Thr | 470 | 475 | 480 |
| Arg | Lys | Asn | Phe | Arg | Thr | Leu | Tyr | Asn | Asn | Leu | Phe | Gly | Pro | Lys | 485 | 490 | 495 |
| Arg | Pro | Lys | Ala | Leu | Lys | Leu | Leu | Gly | Met | Glu | Asp | Asp | Glu | Pro | 500 | 505 | 510 |
| Pro | Ala | Lys | Gly | Lys | Lys | Lys | Lys | Lys | Lys | Lys | Lys | Glu | Glu | Glu | 515 | 520 | 525 |



|                 |                     |                         |     |     |     |
|-----------------|---------------------|-------------------------|-----|-----|-----|
| Ile Asp Ile Asp | Val Asp Asp Pro Ala | Val Ser Arg Phe Gln Tyr | 530 | 535 | 540 |
| Pro Phe His Glu | Leu Met Val Trp Ala | Val Leu Met Lys Arg Gln | 545 | 550 | 555 |
| Lys Met Ala Val | Phe Leu Trp Gln Arg | Gly Glu Glu Ser Met Ala | 560 | 565 | 570 |
| Lys Ala Leu Val | Ala Cys Lys Leu Tyr | Lys Ala Met Ala His Glu | 575 | 580 | 585 |
| Ser Ser Glu Ser | Asp Leu Val Asp Asp | Ile Ser Gln Asp Leu Asp | 590 | 595 | 600 |
| Asn Asn Ser Lys | Asp Phe Gly Gln Leu | Ala Leu Glu Leu Leu Asp | 605 | 610 | 615 |
| Gln Ser Tyr Lys | His Asp Glu Gln Ile | Ala Met Lys Leu Leu Thr | 620 | 625 | 630 |
| Tyr Glu Leu Lys | Asn Trp Ser Asn Ser | Thr Cys Leu Lys Leu Ala | 635 | 640 | 645 |
| Val Ala Ala Lys | His Arg Asp Phe Ile | Ala His Thr Cys Ser Gln | 650 | 655 | 660 |
| Met Leu Leu Thr | Asp Met Trp Met Gly | Arg Leu Arg Met Arg Lys | 665 | 670 | 675 |
| Asn Pro Gly Leu | Lys Val Ile Met Gly | Ile Leu Leu Pro Pro Thr | 680 | 685 | 690 |
| Ile Leu Phe Leu | Glu Phe Arg Thr Tyr | Asp Asp Phe Ser Tyr Gln | 695 | 700 | 705 |
| Thr Ser Lys Glu | Asn Glu Asp Gly Lys | Glu Lys Glu Glu Glu Asn | 710 | 715 | 720 |
| Thr Asp Ala Asn | Ala Asp Ala Gly Ser | Arg Lys Gly Asp Glu Glu | 725 | 730 | 735 |
| Asn Glu His Lys | Lys Gln Arg Ser Ile | Pro Ile Gly Thr Lys Ile | 740 | 745 | 750 |
| Cys Glu Phe Tyr | Asn Ala Pro Ile Val | Lys Phe Trp Phe Tyr Thr | 755 | 760 | 765 |
| Ile Ser Tyr Leu | Gly Tyr Leu Leu Leu | Phe Asn Tyr Val Ile Leu | 770 | 775 | 780 |
| Val Arg Met Asp | Gly Trp Pro Ser Leu | Gln Glu Trp Ile Val Ile | 785 | 790 | 795 |
| Ser Tyr Ile Val | Ser Leu Ala Leu Glu | Lys Ile Arg Glu Ile Leu | 800 | 805 | 810 |
| Met Ser Glu Pro | Gly Lys Leu Ser Gln | Lys Ile Lys Val Trp Leu | 815 | 820 | 825 |
| Gln Glu Tyr Trp | Asn Ile Thr Asp Leu | Val Ala Ile Ser Thr Phe |     |     |     |

| 830 |     |     |     |      | 835 |     |     |     |      | 840 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Met | Ile | Gly | Ala | Ile  | Leu | Arg | Leu | Gln | Asn  | Gln | Pro | Tyr | Met | Gly  |
|     |     |     |     | 845  |     |     |     |     | 850  |     |     |     |     | 855  |
| Tyr | Gly | Arg | Val | Ile  | Tyr | Cys | Val | Asp | Ile  | Ile | Phe | Trp | Tyr | Ile  |
|     |     |     |     | 860  |     |     |     |     | 865  |     |     |     |     | 870  |
| Arg | Val | Leu | Asp | Ile  | Phe | Gly | Val | Asn | Lys  | Tyr | Leu | Gly | Pro | Tyr  |
|     |     |     |     | 875  |     |     |     |     | 880  |     |     |     |     | 885  |
| Val | Met | Met | Ile | Gly  | Lys | Met | Met | Ile | Asp  | Met | Leu | Tyr | Phe | Val  |
|     |     |     |     | 890  |     |     |     |     | 895  |     |     |     |     | 900  |
| Val | Ile | Met | Leu | Val  | Val | Leu | Met | Ser | Phe  | Gly | Val | Ala | Arg | Gln  |
|     |     |     |     | 905  |     |     |     |     | 910  |     |     |     |     | 915  |
| Ala | Ile | Leu | His | Pro  | Glu | Glu | Lys | Pro | Ser  | Trp | Lys | Leu | Ala | Arg  |
|     |     |     |     | 920  |     |     |     |     | 925  |     |     |     |     | 930  |
| Asn | Ile | Phe | Tyr | Met  | Pro | Tyr | Trp | Met | Ile  | Tyr | Gly | Glu | Val | Phe  |
|     |     |     |     | 935  |     |     |     |     | 940  |     |     |     |     | 945  |
| Ala | Asp | Gln | Ile | Asp  | Leu | Tyr | Ala | Met | Glu  | Ile | Asn | Pro | Pro | Cys  |
|     |     |     |     | 950  |     |     |     |     | 955  |     |     |     |     | 960  |
| Gly | Glu | Asn | Leu | Tyr  | Asp | Glu | Glu | Gly | Lys  | Arg | Leu | Pro | Pro | Cys  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Ile | Pro | Gly | Ala | Trp  | Leu | Thr | Pro | Ala | Leu  | Met | Ala | Cys | Tyr | Leu  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Leu | Val | Ala | Asn | Ile  | Leu | Leu | Val | Asn | Leu  | Leu | Ile | Ala | Val | Phe  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Asn | Asn | Thr | Phe | Phe  | Glu | Val | Lys | Ser | Ile  | Ser | Asn | Gln | Val | Trp  |
|     |     |     |     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |
| Lys | Phe | Gln | Arg | Tyr  | Gln | Leu | Ile | Met | Thr  | Phe | His | Asp | Arg | Pro  |
|     |     |     |     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |
| Val | Leu | Pro | Pro | Pro  | Met | Ile | Ile | Leu | Ser  | His | Ile | Tyr | Ile | Ile  |
|     |     |     |     | 1040 |     |     |     |     | 1045 |     |     |     |     | 1050 |
| Ile | Met | Arg | Leu | Ser  | Gly | Arg | Cys | Arg | Lys  | Lys | Arg | Glu | Gly | Asp  |
|     |     |     |     | 1055 |     |     |     |     | 1060 |     |     |     |     | 1065 |
| Gln | Glu | Glu | Arg | Asp  | Arg | Gly | Leu | Lys | Leu  | Phe | Leu | Ser | Asp | Glu  |
|     |     |     |     | 1070 |     |     |     |     | 1075 |     |     |     |     | 1080 |
| Glu | Leu | Lys | Arg | Leu  | His | Glu | Phe | Glu | Glu  | Gln | Cys | Val | Gln | Glu  |
|     |     |     |     | 1085 |     |     |     |     | 1090 |     |     |     |     | 1095 |
| His | Phe | Arg | Glu | Lys  | Glu | Asp | Glu | Gln | Gln  | Ser | Ser | Ser | Asp | Glu  |
|     |     |     |     | 1100 |     |     |     |     | 1105 |     |     |     |     | 1110 |
| Arg | Ile | Arg | Val | Thr  | Ser | Glu | Arg | Val | Glu  | Asn | Met | Ser | Met | Arg  |
|     |     |     |     | 1115 |     |     |     |     | 1120 |     |     |     |     | 1125 |
| Leu | Glu | Glu | Ile | Asn  | Glu | Arg | Glu | Thr | Phe  | Met | Lys | Thr | Ser | Leu  |
|     |     |     |     | 1130 |     |     |     |     | 1135 |     |     |     |     | 1140 |

|   |      |      |      |
|---|------|------|------|
| Gln Thr Val Asp Leu Arg Leu Ala Gln Leu Glu Glu Leu Ser Asn | 1145 | 1150 | 1155 |
| Arg Met Val Asn Ala Leu Glu Asn Leu Ala Gly Ile Asp Arg Ser | 1160 | 1165 | 1170 |
| Asp Leu Ile Gln Ala Arg Ser Arg Ala Ser Ser Glu Cys Glu Ala | 1175 | 1180 | 1185 |
| Thr Tyr Leu Leu Arg Gln Ser Ser Ile Asn Ser Ala Asp Gly Tyr | 1190 | 1195 | 1200 |
| Ser Leu Tyr Arg Tyr His Phe Asn Gly Glu Glu Leu Leu Phe Glu | 1205 | 1210 | 1215 |
| Asp Thr Ser Leu Ser Thr Ser Pro Gly Thr Gly Val Arg Lys Lys | 1220 | 1225 | 1230 |
| Thr Cys Ser Phe Arg Ile Lys Glu Glu Lys Asp Val Lys Thr His | 1235 | 1240 | 1245 |
| Leu Val Pro Glu Cys Gln Asn Ser Leu His Leu Ser Leu Gly Thr | 1250 | 1255 | 1260 |
| Ser Thr Ser Ala Thr Pro Asp Gly Ser His Leu Ala Val Asp Asp | 1265 | 1270 | 1275 |
| Leu Lys Asn Ala Glu Glu Ser Lys Leu Gly Pro Asp Ile Gly Ile | 1280 | 1285 | 1290 |
| Ser Lys Glu Asp Asp Glu Arg Gln Thr Asp Ser Lys Lys Glu Glu | 1295 | 1300 | 1305 |
| Thr Ile Ser Pro Ser Leu Asn Lys Thr Asp Val Ile His Gly Gln | 1310 | 1315 | 1320 |
| Asp Lys Ser Asp Val Gln Asn Thr Gln Leu Thr Val Glu Thr Thr | 1325 | 1330 | 1335 |
| Asn Ile Glu Gly Thr Ile Ser Tyr Pro Leu Glu Glu Thr Lys Ile | 1340 | 1345 | 1350 |
| Thr Arg Tyr Phe Pro Asp Glu Thr Ile Asn Ala Cys Lys Thr Met | 1355 | 1360 | 1365 |
| Lys Ser Arg Ser Phe Val Tyr Ser Arg Gly Arg Lys Leu Val Gly | 1370 | 1375 | 1380 |
| Gly Val Asn Gln Asp Val Glu Tyr Ser Ser Ile Thr Asp Gln Gln | 1385 | 1390 | 1395 |
| Leu Thr Thr Glu Trp Gln Cys Gln Val Gln Lys Ile Thr Arg Ser | 1400 | 1405 | 1410 |
| His Ser Thr Asp Ile Pro Tyr Ile Val Ser Glu Ala Ala Val Gln | 1415 | 1420 | 1425 |
| Ala Glu His Lys Glu Gln Phe Ala Asp Met Gln Asp Glu His His | 1430 | 1435 | 1440 |

|             |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |      |      |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| Val         | Ala | Glu | Ala | Ile | Pro | Arg | Ile | Pro | Arg | Leu | Ser | Leu | Thr | Ile | 1445 | 1450 | 1455 |
| Thr         | Asp | Arg | Asn | Gly | Met | Glu | Asn | Leu | Leu | Ser | Val | Lys | Pro | Asp | 1460 | 1465 | 1470 |
| Gln         | Thr | Leu | Gly | Phe | Pro | Ser | Leu | Arg | Ser | Lys | Ser | Leu | His | Gly | 1475 | 1480 | 1485 |
| His         | Pro | Arg | Asn | Val | Lys | Ser | Ile | Gln | Gly | Lys | Leu | Asp | Arg | Ser | 1490 | 1495 | 1500 |
| Gly         | His | Ala | Ser | Ser | Val | Ser | Ser | Leu | Val | Ile | Val | Ser | Gly | Met | 1505 | 1510 | 1515 |
| Thr         | Ala | Glu | Glu | Lys | Lys | Val | Lys | Lys | Glu | Lys | Ala | Ser | Thr | Glu | 1520 | 1525 | 1530 |
| Thr Glu Cys |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |      |      |

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<211> 1020

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<400> 122

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| Met | Gly | Arg | Gly | Ala | Gly | Arg | Glu | Tyr | Ser | Pro | Ala | Ala | Thr | Thr |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Glu | Asn | Gly | Gly | Gly | Lys | Lys | Lys | Gln | Lys | Glu | Lys | Glu | Leu |
|     |     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Glu | Leu | Lys | Lys | Glu | Val | Ala | Met | Asp | Asp | His | Lys | Leu | Ser |
|     |     |     | 35  |     |     |     |     |     | 40  |     |     |     |     | 45  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Asp | Glu | Leu | Gly | Arg | Lys | Tyr | Gln | Val | Asp | Leu | Ser | Lys | Gly |
|     |     |     |     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Leu | Thr | Asn | Gln | Arg | Ala | Gln | Asp | Val | Leu | Ala | Arg | Asp | Gly | Pro |
|     |     |     |     | 65  |     |     |     |     | 70  |     |     |     |     | 75  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Ala | Leu | Thr | Pro | Pro | Pro | Thr | Thr | Pro | Glu | Trp | Val | Lys | Phe |
|     |     |     |     | 80  |     |     |     |     | 85  |     |     |     |     | 90  |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Arg | Gln | Leu | Phe | Gly | Gly | Phe | Ser | Ile | Leu | Leu | Trp | Ile | Gly |
|     |     |     |     | 95  |     |     |     |     | 100 |     |     |     |     | 105 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Ile | Leu | Cys | Phe | Leu | Ala | Tyr | Gly | Ile | Gln | Ala | Ala | Met | Glu |
|     |     |     |     | 110 |     |     |     |     | 115 |     |     |     |     | 120 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asp | Glu | Pro | Ser | Asn | Asp | Asn | Leu | Tyr | Leu | Gly | Val | Val | Leu | Ala |
|     |     |     |     | 125 |     |     |     |     | 130 |     |     |     |     | 135 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ala | Val | Val | Ile | Val | Thr | Gly | Cys | Phe | Ser | Tyr | Tyr | Gln | Glu | Ala |
|     |     |     |     | 140 |     |     |     |     | 145 |     |     |     |     | 150 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Lys | Ser | Ser | Lys | Ile | Met | Asp | Ser | Phe | Lys | Asn | Met | Val | Pro | Gln |
|     |     |     |     | 155 |     |     |     |     | 160 |     |     |     |     | 165 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gln | Ala | Leu | Val | Ile | Arg | Glu | Gly | Glu | Lys | Met | Gln | Ile | Asn | Ala |
|     |     |     |     | 170 |     |     |     |     | 175 |     |     |     |     | 180 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Glu | Val | Val | Val | Gly | Asp | Leu | Val | Glu | Val | Lys | Gly | Gly | Asp |
|     |     |     |     | 185 |     |     |     |     | 190 |     |     |     |     | 195 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | Val | Pro | Ala | Asp | Leu | Arg | Ile | Ile | Ser | Ser | His | Gly | Cys | Lys |
|     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |     | 210 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Asp | Asn | Ser | Ser | Leu | Thr | Gly | Glu | Ser | Glu | Pro | Gln | Thr | Arg |
|     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     | 225 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ser | Pro | Glu | Phe | Thr | His | Glu | Asn | Pro | Leu | Glu | Thr | Arg | Asn | Ile |
|     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Cys | Phe | Phe | Ser | Thr | Asn | Cys | Val | Glu | Gly | Thr | Ala | Arg | Gly | Ile |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |



|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Val | Ile | Ala | Thr | Gly | Asp | Arg | Thr | Val | Met | Gly | Arg | Ile | Ala | Thr | 260 | 265 | 270 |
| Leu | Ala | Ser | Gly | Leu | Glu | Val | Gly | Arg | Thr | Pro | Ile | Ala | Met | Glu | 275 | 280 | 285 |
| Ile | Glu | His | Phe | Ile | Gln | Leu | Ile | Thr | Gly | Val | Ala | Val | Phe | Leu | 290 | 295 | 300 |
| Gly | Val | Ser | Phe | Phe | Val | Leu | Ser | Leu | Ile | Leu | Gly | Tyr | Ser | Trp | 305 | 310 | 315 |
| Leu | Glu | Ala | Val | Ile | Phe | Leu | Ile | Gly | Ile | Ile | Val | Ala | Asn | Val | 320 | 325 | 330 |
| Pro | Glu | Gly | Leu | Leu | Ala | Thr | Val | Thr | Val | Cys | Leu | Thr | Leu | Thr | 335 | 340 | 345 |
| Ala | Lys | Arg | Met | Ala | Arg | Lys | Asn | Cys | Leu | Val | Lys | Asn | Leu | Glu | 350 | 355 | 360 |
| Ala | Val | Glu | Thr | Leu | Gly | Ser | Thr | Ser | Thr | Ile | Cys | Ser | Asp | Lys | 365 | 370 | 375 |
| Thr | Gly | Thr | Leu | Thr | Gln | Asn | Arg | Met | Thr | Val | Ala | His | Met | Trp | 380 | 385 | 390 |
| Phe | Asp | Asn | Gln | Ile | His | Glu | Ala | Asp | Thr | Thr | Glu | Asp | Gln | Ser | 395 | 400 | 405 |
| Gly | Ala | Thr | Phe | Asp | Lys | Arg | Ser | Pro | Thr | Trp | Thr | Ala | Leu | Ser | 410 | 415 | 420 |
| Arg | Ile | Ala | Gly | Leu | Cys | Asn | Arg | Ala | Val | Phe | Lys | Ala | Gly | Gln | 425 | 430 | 435 |
| Glu | Asn | Ile | Ser | Val | Ser | Lys | Arg | Asp | Thr | Ala | Gly | Asp | Ala | Ser | 440 | 445 | 450 |
| Glu | Ser | Ala | Leu | Leu | Lys | Cys | Ile | Glu | Leu | Ser | Cys | Gly | Ser | Val | 455 | 460 | 465 |
| Arg | Lys | Met | Arg | Asp | Arg | Asn | Pro | Lys | Val | Ala | Glu | Ile | Pro | Phe | 470 | 475 | 480 |
| Asn | Ser | Thr | Asn | Lys | Tyr | Gln | Leu | Ser | Ile | His | Glu | Arg | Glu | Asp | 485 | 490 | 495 |
| Ser | Pro | Gln | Ser | His | Val | Leu | Val | Met | Lys | Gly | Ala | Pro | Glu | Arg | 500 | 505 | 510 |
| Ile | Leu | Asp | Arg | Cys | Ser | Thr | Ile | Leu | Val | Gln | Gly | Lys | Glu | Ile | 515 | 520 | 525 |
| Pro | Leu | Asp | Lys | Glu | Met | Gln | Asp | Ala | Phe | Gln | Asn | Ala | Tyr | Met | 530 | 535 | 540 |
| Glu | Leu | Gly | Gly | Leu | Gly | Glu | Arg | Val | Leu | Gly | Phe | Cys | Gln | Leu | 545 | 550 | 555 |

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Asn | Leu | Pro | Ser | Gly | Lys | Phe | Pro | Arg | Gly | Phe | Lys | Phe | Asp | Thr | 560 | 565 | 570 |
| Asp | Glu | Leu | Asn | Phe | Pro | Thr | Glu | Lys | Leu | Cys | Phe | Val | Gly | Leu | 575 | 580 | 585 |
| Met | Ser | Met | Ile | Asp | Pro | Pro | Arg | Ala | Ala | Val | Pro | Asp | Ala | Val | 590 | 595 | 600 |
| Gly | Lys | Cys | Arg | Ser | Ala | Gly | Ile | Lys | Val | Ile | Met | Val | Thr | Gly | 605 | 610 | 615 |
| Asp | His | Pro | Ile | Thr | Ala | Lys | Ala | Ile | Ala | Lys | Gly | Val | Gly | Ile | 620 | 625 | 630 |
| Ile | Ser | Glu | Gly | Asn | Glu | Thr | Val | Glu | Asp | Ile | Ala | Ala | Arg | Leu | 635 | 640 | 645 |
| Asn | Ile | Pro | Met | Ser | Gln | Val | Asn | Pro | Arg | Glu | Ala | Lys | Ala | Cys | 650 | 655 | 660 |
| Val | Val | His | Gly | Ser | Asp | Leu | Lys | Asp | Met | Thr | Ser | Glu | Gln | Leu | 665 | 670 | 675 |
| Asp | Glu | Ile | Leu | Lys | Asn | His | Thr | Glu | Ile | Val | Phe | Ala | Arg | Thr | 680 | 685 | 690 |
| Ser | Pro | Gln | Gln | Lys | Leu | Ile | Ile | Val | Glu | Gly | Cys | Gln | Arg | Gln | 695 | 700 | 705 |
| Gly | Ala | Ile | Val | Ala | Val | Thr | Gly | Asp | Gly | Val | Asn | Asp | Ser | Pro | 710 | 715 | 720 |
| Ala | Leu | Lys | Lys | Ala | Asp | Ile | Gly | Ile | Ala | Met | Gly | Ile | Ser | Gly | 725 | 730 | 735 |
| Ser | Asp | Val | Ser | Lys | Gln | Ala | Ala | Asp | Met | Ile | Leu | Leu | Asp | Asp | 740 | 745 | 750 |
| Asn | Phe | Ala | Ser | Ile | Val | Thr | Gly | Val | Glu | Glu | Gly | Arg | Leu | Ile | 755 | 760 | 765 |
| Phe | Asp | Asn | Leu | Lys | Lys | Ser | Ile | Ala | Tyr | Thr | Leu | Thr | Ser | Asn | 770 | 775 | 780 |
| Ile | Pro | Glu | Ile | Thr | Pro | Phe | Leu | Leu | Phe | Ile | Ile | Ala | Asn | Ile | 785 | 790 | 795 |
| Pro | Leu | Pro | Leu | Gly | Thr | Val | Thr | Ile | Leu | Cys | Ile | Asp | Leu | Gly | 800 | 805 | 810 |
| Thr | Asp | Met | Val | Pro | Ala | Ile | Ser | Leu | Ala | Tyr | Glu | Ala | Ala | Glu | 815 | 820 | 825 |
| Ser | Asp | Ile | Met | Lys | Arg | Gln | Pro | Arg | Asn | Ser | Gln | Thr | Asp | Lys | 830 | 835 | 840 |
| Leu | Val | Asn | Glu | Arg | Leu | Ile | Ser | Met | Ala | Tyr | Gly | Gln | Ile | Gly | 845 | 850 | 855 |
| Met | Ile | Gln | Ala | Leu | Gly | Gly | Phe | Phe | Thr | Tyr | Phe | Val | Ile | Leu |     |     |     |

| 860 |     |     |     |      | 865 |     |     |     |      | 870 |     |     |     |      |
|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|
| Ala | Glu | Asn | Gly | Phe  | Leu | Pro | Ser | Arg | Leu  | Leu | Gly | Ile | Arg | Leu  |
|     |     |     |     | 875  |     |     |     |     | 880  |     |     |     |     | 885  |
| Asp | Trp | Asp | Asp | Arg  | Thr | Met | Asn | Asp | Leu  | Glu | Asp | Ser | Tyr | Gly  |
|     |     |     |     | 890  |     |     |     |     | 895  |     |     |     |     | 900  |
| Gln | Glu | Trp | Thr | Tyr  | Glu | Gln | Arg | Lys | Val  | Val | Glu | Phe | Thr | Cys  |
|     |     |     |     | 905  |     |     |     |     | 910  |     |     |     |     | 915  |
| His | Thr | Ala | Phe | Phe  | Ala | Ser | Ile | Val | Val  | Val | Gln | Trp | Ala | Asp  |
|     |     |     |     | 920  |     |     |     |     | 925  |     |     |     |     | 930  |
| Leu | Ile | Ile | Cys | Lys  | Thr | Arg | Arg | Asn | Ser  | Val | Phe | Gln | Gln | Gly  |
|     |     |     |     | 935  |     |     |     |     | 940  |     |     |     |     | 945  |
| Met | Lys | Asn | Lys | Ile  | Leu | Ile | Phe | Gly | Leu  | Leu | Glu | Glu | Thr | Ala  |
|     |     |     |     | 950  |     |     |     |     | 955  |     |     |     |     | 960  |
| Leu | Ala | Ala | Phe | Leu  | Ser | Tyr | Cys | Pro | Gly  | Met | Gly | Val | Ala | Leu  |
|     |     |     |     | 965  |     |     |     |     | 970  |     |     |     |     | 975  |
| Arg | Met | Tyr | Pro | Leu  | Lys | Val | Thr | Trp | Trp  | Phe | Cys | Ala | Phe | Pro  |
|     |     |     |     | 980  |     |     |     |     | 985  |     |     |     |     | 990  |
| Tyr | Ser | Leu | Leu | Ile  | Phe | Ile | Tyr | Asp | Glu  | Val | Arg | Lys | Leu | Ile  |
|     |     |     |     | 995  |     |     |     |     | 1000 |     |     |     |     | 1005 |
| Leu | Arg | Arg | Tyr | Pro  | Gly | Gly | Trp | Val | Glu  | Lys | Glu | Thr | Tyr | Tyr  |
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